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GEOLOGICAL SURVEY OF ALABAMA
WALTER BRYAN JONES, STATE GEOLOGIST

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BULLETIN NO. 34

# STATISTICS OF THE MINERAL PRODUCTION OF ALABAMA FOR 1925

## WITH A SPECIAL DISCUSSION OF COAL AND COKE

COMPILED FROM THE MINERAL RESOURCES
OF THE UNITED STATES

BY
WALTER B. JONES, PH.D.
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UNIVERSITY, ALABAMA

1928

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# LETTER OF TRANSMITTAL

University, Ala., April, 1928.

His Excellency,
Bibb Graves,
Governor of Alabama,
Montgomery, Ala.

SIR:—I have the honor to transmit herewith the manuscript of a report on the Mineral Production of Alabama for the year 1925, with the request that it be printed as Bulletin No. 34 of the Geological Survey of Alabama.

Very respectfully,
WALTER B. JONES,
*State Geologist.*

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# PREFACE

THE statistics of all the mines in the following pages have been collected in co-operation with the United States Bureau of Mines, and have been compiled from advance chapters and tabulation sheets of the Mineral Resources of the United States, a publication of the Federal Government.

The introductory matter, statistics and discussions in each of these articles has either been taken without change, or else has been rearranged or condensed, or entirely rewritten to suit it to our present purposes. In either case, credit is given to the author.

The various mineral industries and resources are described in more or less detail in Bulletin 28*, of the Survey. Consequently, in order to avoid duplication, much explanatory matter is left out of the present report.

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*Index to the Mineral Resources of Alabama; by Walter B. Jones. 256 pp., 42 pls., 15 figs., 1926.

# INTRODUCTION

THE mineral industries of Alabama in 1925 showed a slight improvement over 1924, although falling short of the banner years 1918 and 1920. All of the major groups showed small increases over the previous year, and there were large increases in several of the smaller industries, notably limestone, sand and gravel and sandstone. This may be attributed to the increase in road and general construction work which was prevalent throughout the State.

Transportation conditions remained effective and dependable, while labor troubles have been practically unknown for a good many years.

Installation of improved mining machinery has continued to be of great importance, especially in the mining of iron ore and coal.

The whole situation may be summarized in the statement that the operations are typical of normal conditions.

The statistics and discussion in the various chapters of this bulletin have been changed somewhat from the custom which has been in vogue for several years. The most radical change is the omission of much introductory matter in the chapters on graphite, iron ore, mica, etc. The reason for this is that this bulletin is mainly for the purpose of enumerating the production and discussions arising therefrom. Much information dealing with particular mineral resources, other than statistical, may be had from the general publications of this Survey, a list of which will be sent upon request. Most of the principal industries and many of the minor ones have been treated in a more or less detailed manner in the host of reports issued by this Survey over a period of more than half a century. All of the introductory matter which has been left out of this report may be found in revised and enlarged form in the latest edition of the Index to the Mineral Resources of Alabama, published as Bulletin 28 of the Geological Survey of Alabama, in 1926.

Owing to the fact that coal has long been the most important of the raw materials in the State, it has been thought advisable to carry a special discussion of coal and coke, which will be found under these headings. There will be very much of particular interest to those interested in coal in the United States, and it is hoped that the special discussion will be well worth while.

A summary of the mineral production of the state for 1924 and 1925 is given in the table below, in alphabetical order:

*Mineral Production in Alabama, 1924 and 1925*

| PRODUCT | 1924 | | Rank | 1925 | | Rank |
|---|---|---|---|---|---|---|
| Asphalt rock (tons) | 8,498 | $ 29,743 | 17 | 23,550 | $ 77,080 | 16 |
| Cement (barrels) | | | | | | |
| Portland | 5,542,687 | 9,147,367 | 5 | 6,045,967 | 9,824,439 | 5 |
| Puzzolan* | 745,369 | 1,147,088 | 9 | 939,062 | 1,491,333 | 8 |
| Clay (tons) | 86,939 | 120,945 | 15 | 107,340 | 169,311 | 15 |
| Clay products | | 4,652,308 | 6 | | 4,987,896 | 6 |
| Coal (tons) | 19,130,184 | 44,756,301 | 2 | 20,004,395 | 42,442,000 | 2 |
| Coke (tons) | | | | | | |
| Beehive | 154,686 | 840,843 | 11 | 88,328 | 453,870 | 12 |
| By-Product | 4,386,372 | 16,563,223 | 3 | 4,582,143 | 16,347,971 | 3 |
| Iron ore (tons) | 6,557,596 | 13,927,551 | 4 | 6,891,081 | 14,134,677 | 4 |
| Lime (tons) | | | | | | |
| Raw | 204,059 | 1,812,282 | 7 | 207,699 | 1,679,155 | 7 |
| Hydrated | 23,465 | 215,468 | 13 | 25,989 | 229,076 | 14 |
| Limestone (tons) | 1,170,640 | 1,253,971 | 8 | 1,224,710 | 1,250,742 | 9 |
| Manganese ore (tons) | 1,853 | 31,676 | 16 | 1,236 | 15,631 | 17 |
| Marble** (tons) | 33,140 | 626,370 | 12 | 37,520 | 637,498 | 11 |
| Pig Iron (tons) | 2,667,361 | 55,791,228 | 1 | 2,910,370 | 57,777,275 | 1 |
| Sand and Gravel (tons) | 2,443,753 | 917,914 | 10 | 2,683,042 | 1,244,398 | 10 |
| Sandstone (tons) | 50,210 | 123,180 | 14 | 131,870 | 289,692 | 13 |
| Miscellaneous*** | | 15,314 | | | 10 | |
| Total | | $151,972,772 | | | $153,052,054 | |

*Includes Illinois and Indiana.
**Includes Arkansas.
***1924, mica, fuller's earth, barytes, graphite. 1925, Do.

Below is a tabular presentation of the value of the mineral products of Alabama, as estimated for the years 1912 to 1925, inclusive:

| Year | Value |
|---|---|
| 1912 | $ 60,141,793 |
| 1913 | 67,530,089 |
| 1914 | 56,769,559 |
| 1915 | 61,791,958 |
| 1916 | 94,987,229 |
| 1917 | 158,008,952 |
| 1918 | 189,426,896 |
| 1919 | 137,187,345 |
| 1920 | 197,699,592 |
| 1921 | 93,353,444 |
| 1922 | 119,080,536 |
| 1923 | 167,734,331 |
| 1924 | 151,972,772 |
| 1925 | 153,052,054 |

# STATISTICS OF THE MINERAL PRODUCTION OF ALABAMA FOR 1925

## ASPHALT AND RELATED BITUMENS

By G. R. Hopkins and A. B. Coons*

### PRODUCTION

Sales of native asphalt and related bitumens, including bituminous rock, gilsonite, and wurtzilite (elaterite), at mines in the United States in 1925, amounted to 584,850 short tons, valued at $4,148,400. This was an increase over 1924 of 4 per cent in quantity and of 5 per cent in value.

Sales of asphalt and asphaltic materials manufactured from petroleum at refineries in the United States during 1925 amounted to 3,178,370 short tons, which is an increase over 1924 of nearly 100,000 tons, or 3 per cent. These sales were valued at $42,825,770, an increase over 1924 of 19 per cent. Of the total sales during 1925, 1,206,700 tons, with a value of $15,305,760, was manufactured from domestic crude petroleum, and 1,971,670 tons, with a value of $27,520,010, was produced from foreign crude petroleum.

The proportions of asphalt manufactured from domestic petroleum and from foreign petroleum in 1925 were virtually the same as in 1924. However, the asphalt from foreign petroleum showed a much larger increase in average value per ton.

### NATIVE ASPHALT AND RELATED BITUMENS

Kentucky, in 1925, maintained its rank among the States as the chief producer of native asphalt, with sales of 286,850 short tons of bituminous rock, valued at almost $2,500,000. Texas, with 204,530 tons of bituminous rock, was second in quantity, a position that it held in 1923 and 1924. As in 1923 and 1924, Utah was the only State to produce bitumens other than bituminous rock, and sales of 39,520 tons of gilsonite and 270 tons of wurtzilite, valued at $767,900 and $18,400, respectively, were reported. An increase in output and in the average value of its products enabled Utah to pass Texas and to resume its rank as second to Kentucky in total value.

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*Figures on imports and exports compiled by J. A. Dorsey, of the U. S. Bureau of Mines, from records of the Bureau of Foreign and Domestic Commerce.

*Bituminous Rock sold at mines in the United States, 1921-1925*

(Value f. o. b. mine)

| | 1921 | | 1922 | | 1923 | | 1924 | | 1925 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value |
| Bituminous rock: | | | | | | | | | | |
| Alabama | ------ | ------ | ------ | ------ | 1,200 | $4,200 | 8,498 | $29,743 | 23,550 | $77,080 |
| Texas | 260,468 | $1,707,188 | 152,567 | $558,274 | 151,356 | 555,533 | 220,598 | 779,696 | 204,530 | 692,730 |
| California | | | 97,924 | 907,664 | 2,945 | 11,780 | 3,731 | 14,088 | 2,680 | 16,100 |
| Kentucky | | | | | 184,300 | 1,468,396 | 274,743 | 2,386,557 | 286,850 | 2,493,360 |
| Missouri | ------ | ------ | ------ | ------ | ------ | ------ | 300 | 3,150 | ------ | ------ |
| Oklahoma | 23,569 | 81,527 | 47,556 | 163,502 | 25,800 | 150,100 | 17,961 | 80,825 | 27,450 | 82,830 |
| Total | 284,038 | 1,788,715 | 298,017 | 1,629,440 | 365,601 | 2,190,009 | 525,831 | 3,294,059 | 545,060 | 3,362,100 |

*Bituminous rock.*—Production of bituminous rock, which is used for road building, was reported in 1925 from Alabama, California, Kentucky, Oklahoma, and Texas. Missouri, which entered the ranks of the producers in 1924, made no production in 1925. Production and value for the United States in 1925, as measured by sales at the mines, increased 4 and 2 per cent, respectively.

### THE ASPHALT ASSOCIATION

The members of the asphalt industry established in 1919 the Asphalt Association, which, in addition to other activities, is engaged in collecting and disseminating information useful to both producers and users of asphalt. The address of the association is 441 Lexington Avenue, New York, N. Y. Branch offices are at the following addresses:

729 Hearst Building, Hearst Square, Chicago, Ill.
Whitney Central Building, New Orleans, La.
314 Dwight Building, Kansas City, Mo.
25 North Pearl Street, Albany, N. Y.
302 Latta Arcade Building, Charlotte, N. C.
Excelsior Life Insurance Building, Toronto, Ontario, Canada.

The officers are: President, C. G. Sheffield, of the Standard Oil Co. of New York; vice-president, L. M. Shaw, of the New Orleans Refining Co.; treasurer, Herbert Spencer, of the Standard Oil Co. of New Jersey; secretary and general manager, J. E. Pennybacker.

## PRODUCERS

### NATIVE ASPHALT AND RELATED BITUMENS

Production of native asphalt and related bitumens was reported in this country in 1925 by the following operators:

Absopure Gilsonite Co., 615 Cooper Building, Denver, Colo.
Acme Rock Asphalt Co., Fullerton Building, St. Louis, Mo.
*Alabama Rock Asphalt Co., Florence, Ala.*
American Asphalt Association, 919 Wainwright Building, St. Louis, Mo.
City Street Improvement Co., 400 California Street, San Francisco, Calif.
*Colbert Limerock Asphalt Co., Cherokee, Ala.*
Crown Rock Asphalt Co., 911 Neave Building, Cincinnati, Ohio.
Diamond Gilsonite Co., Fort Duchesne, Utah.
Garfield Rock Asphalt Co., 311 Norton Building, Louisville, Ky.
Gilson Asphaltum Co., 1900 Land Title Building, Philadelphia, Pa.
Kentucky Rock Asphalt Co., Marion E. Taylor Building, Louisville, Ky.

**Natural Rock Asphalt** Corporation, Owensboro, Ky.
**Ohio Valley Rock** Asphalt Co., Schmidt Building, Cincinnati, Ohio.
**Raven Mining Co.** of Utah, 140 South Dearborn Street, Chicago, Ill.
**Robert M. Lucas** Mines Co., 1955 West Thirty-first Street, Chicago, Ill.
**Texas Rock Asphalt** Co., San Antonio, Tex.
**Utah Gilsonite Co.**, Wainwright Building, St. Louis, Mo.
**Uvalde Rock** Asphalt Co., San Antonio, Tex.
**Western Paving** Co., Tradesman's Building, Oklahoma City, Okla.
**White's Uvalde** Mines, City National Bank Building, San Antonio, Tex.

# BAUXITE

By JAMES M. HILL

## BAUXITE IN THE UNITED STATES

The bauxite deposits of the United States are in central Arkansas, northeastern and southeastern Alabama, northwestern and west-central Georgia, northeastern Mississippi, and eastern Tennessee.

The bauxite from all localities in the United States, though it may vary in chemical composition, is on the whole similar in general appearance, with the exception of the "granite bauxite" of the Arkansas field. The greater part of the American bauxite appears to be made up of rounded pebblelike bodies set in a fine-grained matrix, which may also consist of small rounded particles or may be as fine grained as the finest clay. The pebble or pisolite form is so general that it is the conspicuous characteristic of American bauxite.

There is only one way to determine the value of bauxite, and that is by chemical analysis, which should show total silica, alumina, titanium oxide, iron oxide, and water. Bauxites of commercial grade should carry at least 52 per cent of alumina.

Some measure of the relative quality of dried bauxite can be had by grinding a sample in an agate mortar for half a minute (J. M. Hill test). A bauxite of good grade will be found hard to grind and will stick to the mortar with such tenacity that it will have to be scoured out; a poor bauxite or bauxitic clay will grind much more easily and will stick very little, if at all; and clay or kaolin grinds with ease and does not stick to the mortar. Similar results are found if the sample is rubbed on glass; the glass will not be scratched by even high-grade bauxite.

*Alabama.*—No bauxite was produced in Alabama in 1925. There are a number of scattered deposits of bauxite of chemical grade in the Eufaula district, the area between Fort Gaines and Clayton, in Henry and Barbour Counties, which will doubtless be worked when conditions warrant. Rettger* described the Eufaula field as covering an area 20 miles long and 10 miles wide, whose center is 13 miles south-west of Eufaula, in which there are some 200 known bauxite occurrences, 60 of which have been tested and 75 others outlined, which contain a fair amount of marketable ore. The deposits are pockets having vertical dimensions approximately equal to the horizontal. The largest pocket is 200 by 100 feet, but most of the ore bodies tested are much smaller and range up to 50 feet deep. Rettger believes that the bauxite resulted from lateritic alteration of kaolins.

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*Rettger, R. E., "The bauxite deposits of southeastern Alabama": Economic Geology, vol. 20, 1925, pp. 671-685.

### PRICES

The price of bauxite is regularly quoted in the Engineering and Mining Journal. Crushed bauxite was quoted at $5.50 and $8.50 a ton throughout the year. Dried and pulverized bauxite was quoted at $14, and calcined bauxite at $19 to $20 a ton f. o. b. shipping point. French and Adriatic bauxite was offered at $4 to $7 and Guiana at $8.50 c. i. f. American ports.

Under the tariff act of 1922 crude bauxite is dutiable at the rate of $1 a ton, and alumina hydrate or refined bauxite at half a cent a pound. (See par. 6, schedule 1, and par. 207, schedule 2.)

### ALUMINOUS ABRASIVES AND REFRACTORIES

High-alumina refractories are finding a wider market. That their production is expanding is shown by the growing demand for high-alumina clays and other aluminous minerals by ceramists throughout the country. In 1925 the makers of refractory brick took 260 long tons of bauxite and 15,177 short tons of high-alumina (diaspore) clay. Increasing quantities of andalusite and dumortierite, the newly applied aluminous raw materials, were shipped from deposits in California and Nevada during 1925.

### ALUMINA CEMENTS

Although producers reported no sales of domestic bauxite to makers of high-alumina cement, it is known that a large quantity of foreign bauxite was consumed by this new industry. Thomas* recently described the use of these quick-setting cements in oil-well work in California.

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*Thomas, C. C., "Use of quick-setting cements in oil wells": California Oil Fields (Summary of operations), vol. 11, October, 1925, pp. 5-13.

# CEMENT

By B. W. Bagley

## GENERAL REVIEW

Early in January, 1926, the Bureau of Mines published a summary of the monthly estimates of output of Portland cement in 1925, compiled from the monthly reports of producers. These preliminary figures, which showed a production of about 161,202,000 barrels and shipments of about 156,724,000 barrels, were within about 0.3 and 0.4 per cent, respectively, of the final figures for 1925.

At the beginning of 1925 the production of Portland cement was slightly larger and shipments were slightly less than at the beginning of 1924. As demand increased during the spring and summer, production and shipments attained much higher monthly levels during most of the year than in 1924 and reached their maximum in August, when they were the highest for any month in the history of the industry. The production in August—16,3419,000 barrels—exceeded that of the entire country for the year 1901 by more than 29 per cent.

At the end of September, when stocks were lowest, there was about 10,247,000 barrels of finished cement at the mills. The monthly average for such stocks for the year was more than 16,000,000 barrels, as compared with about 13,200,000 barrels in 1924.

Engineering and building construction was responsible for the unprecedented demand for cement in 1925. The general trend of building construction during the years 1922 to 1925 is shown by the following table, which summarizes the value of buildings, as shown by permits issued during those years, in 180 cities representing all parts of the United States. The grand totals for the four years increased successively, and in 1925 and throughout the four years all districts showed gains except the central and northern Great Plains States and California, which showed decreases in 1924.

*Value of buildings shown by permits issued in 180 cities in the United States, 1922-1925**

| Group of Cities | 1922 | 1923 | 1924 | 1925 | Increase 1925 over 1924 (per cent) |
|---|---|---|---|---|---|
| New England | $152,680,000 | $153,820,000 | $183,099,000 | $225,757,000 | 23 |
| New York and northern New Jersey | 773,747,000 | 983,772,000 | 1,062,275,000 | 1,280,286,000 | 21 |
| Eastern Pennsylvania, southern New Jersey, Maryland, Delaware, District of Columbia, and Virginia | 287,528,000 | 303,717,000 | 330,909,000 | 381,705,000 | 15 |
| Western Pennsylvania, West Virginia, Ohio, and Kentucky | 214,628,000 | 243,146,000 | 255,218,000 | 300,454,000 | 18 |
| Illinois, Indiana, Iowa, Wisconsin, Michigan, Missouri, Kansas, Nebraska, and Oklahoma | 556,604,000 | 726,319,000 | 711,077,000 | 836,811,000 | 18 |
| Minnesota, North Dakota, and South Oakota | 65,671,000 | 80,562,000 | 55,912,000 | 65,026,000 | 16 |
| North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Arkansas, and Louisiana | 119,858,000 | 145,621,000 | 168,561,000 | 226,622,000 | 34 |
| Arizona and Texas | 55,205,000 | 64,974,000 | 73,468,000 | 91,050,000 | 24 |
| Colorado, Utah, Montana, and Idaho | 25,911,000 | 31,627,000 | 34,073,000 | 36,171,000 | 6 |
| California, Washington, and Oregon | 302,006,000 | 408,351,000 | 383,059,000 | 405,258,000 | 6 |
|  | 2,553,838,000 | 3,141,909,000 | 3,257,651,000 | 3,849,140,000 | 18 |

*From Bulletin of Portland Cement Association, showing values tabulated in detail by cities, based on Bradstreet's and F. W. Dodge Corporation building statistics.

The other table summarizes the value of contracts awarded for buildings of all classes and for engineering construction of all other kinds, including public works. The net increase in 1925 for construction work of all kinds was considerably higher than that for buildings alone.

*Value of contracts awarded for building and all other construction work in eastern and central States, 1922-1925**

| Group of States | 1922 | 1923 | 1924 | 1925 | Increase 1925 over 1924 (per cent) |
|---|---|---|---|---|---|
| New England | $333,572,000 | $332,857,000 | $ 352,195,000 | $477,181,000 | 35 |
| New York and northern New Jersey | 891,321,000 | 1,068,935,000 | 1,326,896,000 | 1,601,257,000 | 21 |
| Eastern Pennsylvania, southern New Jersey, Maryland, Delaware, District of Columbia, and Virginia | 418,869,000 | 374,182,000 | 477,746,000 | 552,318,000 | 16 |
| Western Pennsylvania, West Virginia, Ohio, and Kentucky | 534,575,000 | 593,994,000 | 578,365,000 | 828,642,000 | 43 |
| Illinois, Indiana, Iowa, Wisconsin, Michigan, Missouri, Kansas, Nebraska and Oklahoma | 1,048,329,000 | 1,006,422,000 | 1,049,586,000 | 1,487,310,000 | 42 |
| Minnesota, North and South Dakota, and northern Michigan | 78,564,000 | 127,336,000 | 88,264,000 | 95,229,000 | 8 |
| North and South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Arkansas, and Louisiana | (†) | 486,757,000 | 606,255,000 | 779,132,000 | 29 |
|  | §3,305,230,000 | 3,990,483,000 | 4,479,307,000 | 5,821,069,000 | 30 |

*From Bulletin of Portland Cement Association based on compilations by F. W. Dodge Corporation.

†No statistics available prior to 1923.

§Exclusive of southeastern States.

### CHIEF HYDRAULIC CEMENTS

The accompanying table gives the shipments of Portland and other (masonry, natural, and puzzolan) cements in 1923 to 1925. The shipments of these cements from the mills in the United States in 1925 increased nearly 8 per cent in quantity and more than 5 per cent in value over the shipments in 1924.

Statistics of output of alumina cement, representing the operations of only one manufacturer in the United States, are not included in this or other tables of this report. No production of this type of cement in the United States was reported in 1923, but it was marketed in 1924 and to a considerable extent in 1925. The indications are that its use will increase steadily.

*Hydraulic cements shipped from mills in the United States, 1923-1925*

| Class | 1923 | | 1924 | | 1925 | |
|---|---|---|---|---|---|---|
| | Barrels | Value | Barrels | Value | Barrels | Value |
| Portland | 135,912,118 | $257,684,424 | 146,047,549 | $264,046,708 | 157,295,212 | $278,524,108 |
| Masonry, natural, and puzzolan | 1,271,674 | 1,947,352 | 1,418,461 | 2,006,559 | 1,751,725 | 2,551,583 |
| | 137,183,792 | 259,631,776 | 147,466,010 | 266,053,267 | 159,046,937 | 281,075,691 |

The following table gives the production and value of natural, Portland, and puzzolan cements from 1916 to 1925.

*Principal hydraulic cements produced in the United States, 1916-1925*

| Year | Masonry, natural, and puzzolan cements | | Portland cement | | Total | |
|---|---|---|---|---|---|---|
| | Barrels | Value** | Barrels | Value** | Barrels | Value** |
| 1916 | 842,137 | $430,874 | 91,521,198 | $100,947,881 | 92,363,335 | $101,378.755 |
| 1917 | 639,456 | 435,370 | 92,814,202 | 125,670,430 | 93,453,658 | 126,105,800 |
| 1918 | 432,966 | 401,341 | 71,081,663 | 113,730,661 | 71,514,629 | 114,132,002 |
| 1919 | 528,589 | 583,554 | 80,777,935 | 138,130,269 | 81,306,524 | 138,713,823 |
| 1920 | 767,481 | 1,150,890 | 100,023,245 | 202,046,955 | 100,790,726 | 203,197,845 |
| 1921 | 539,402 | 897,025 | 98,842,049 | 186,811,473 | 99,381,451 | 187,708,498 |
| 1922 | 889,428 | 1,293,598 | 114,789,984 | 202,030,372 | 115,679,412 | 203,323,970 |
| 1923 | 1,271,674 | 1,947,352 | 137,460,238 | 261,174,452 | 138,731,912 | 263,121,804 |
| 1924 | 1,418,461 | 2,006,559 | 149,358,109 | 270,338,177 | 150,776,570 | 272,344,736 |
| 1925 | 1,729,343 | 2,524,841 | 161,658,901 | 286,136,255 | 163,388,244 | 288,661,096 |

*The figures for natural and puzzolan cements from 1916 to 1924 represent shipments. Figures for production are not available prior to 1925.

**The values given for the production of Portland cement for all years and for the production of masonry, natural, and puzzolan cements for 1925 have been calculated at the average value of shipments.

# PORTLAND CEMENT

## PRODUCTION, SHIPMENTS, AND STOCKS

The total output of Portland cement in the United States in 1925 showed an increase of 8 per cent in quantity and more than 5 per cent in gross value. The average factory value decreased 4 cents a barrel, or more than 2 per cent. The production of 161,658,901 barrels of 376 pounds net is equivalent to 646,635,604 sacks, 27,135,601 long tons, or 30,391,873 short tons.

In the accompanying table the statistics are arranged by States, so far as possible. The term "active plant" is applied to a mill or to a group of mills situated at one place and operated by one company; if a company has establishments at different places, its mill or group of mills at each place is counted as a plant. In the table by districts the statistics are for groups of States, or parts of States, that are geographically and commercially related.

Of the 29 States in which Portland cement was manufactured in 1925 all but 5 showed increases in production and all but 8 showed increases in shipments as compared with 1924. All the commercial districts except eastern Missouri-Iowa-Minnesota-South Dakota and Colorado-Utah showed increases in shipments; the gains in production ranged from 4 to 30 per cent and in shipments from 3 to 28 per cent. In 1925 production exceeded shipments by 4,363,689 barrels.

The statistical tables show large increases in production in certain States or districts. For instance, in Washington there was a gain of 35 per cent and in Ohio, where two large mills began making cement in 1925, there was a gain of 24 per cent. In Michigan, where the initial production of another new plant was recorded, there was a gain of 18 per cent. The State of New York showed a gain of 16 per cent. The production in other States, such as Georgia and Texas, was likewise increased by the building of new mills. The increase in output where no new mills were erected was, as a rule, due to larger manufacturing facilities, stimulated, no doubt, by the growth of road-building and other construction work.

*Portland cement produced, shipped and in stock in the United States, 1924-25, by States*

| State | Production |  |  |  |  | Shipments |  |  |  |  |  |  | Stock (Dec. 31) |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Active plants |  | Barrels |  | Increase or decrease, 1925 (per cent) | 1924 |  | 1925 |  | Average factory value per barrel |  | Increase or decrease in quantity, 1925 (per cent) | Barrels |  | Increase or decrease, 1925 (per cent) |
|  | 1924 | 1925 | 1924 | 1925 |  | Barrels | Value | Barrels | Value | 1924 | 1925 |  | 1924 (revised) | 1925 |  |
| Alabama | 5 | 5 | 5,552,550 | 6,288,117 | +13 | 5,542,687 | $9,147,367 | 6,045,967 | $9,824,439 | $1.65 | $1.62 | +9 | 146,229 | 388,379 | +166 |
| California | 10 | 10 | 11,615,379 | 13,098,140 | +13 | 11,481,730 | 25,532,707 | 13,109,531 | 26,159,531 | 2.22 | 2.00 | +14 | 502,584 | 491,298 | —2 |
| Illinois | 4 | 4 | 6,994,323 | 7,101,024 | +2 | 6,955,455 | 12,026,310 | 6,749,532 | 11,481,576 | 1.73 | 1.70 | —3 | 691,334 | 1,042,826 | +51 |
| Iowa | 5 | 5 | 5,624,466 | 4,648,145 | —17 | 4,881,613 | 8,811,587 | 4,856,849 | 8,674,563 | 1.81 | 1.79 | —1 | 1,695,193 | 1,486,489 | —12 |
| Kansas | 7 | 7 | 5,894,236 | 6,511,393 | +10 | 5,809,646 | 9,900,547 | 6,513,297 | 10,861,506 | 1.70 | 1.67 | +12 | 892,413 | 890,509 | —.2 |
| Michigan | 15 | 16 | 9,259,781 | 10,936,181 | +18 | 8,991,270 | 16,405,761 | 10,073,453 | 17,511,908 | 1.81 | 1.74 | +12 | 1,060,047 | 1,922,775 | +81 |
| Missouri | 5 | 5 | 7,871,621 | 8,331,751 | +6 | 7,711,206 | 13,515,267 | 8,168,165 | 14,155,795 | 1.75 | 1.73 | +6 | 921,165 | 1,084,751 | +18 |
| New York | 9 | 9 | 7,571,856 | 8,769,584 | +16 | 7,435,875 | 13,460,594 | 8,534,089 | 14,967,642 | 1.81 | 1.75 | +15 | 792,831 | 1,028,326 | +30 |
| Ohio | 7 | 9 | 4,600,835 | 5,714,685 | +24 | 4,298,027 | 7,836,325 | 5,426,768 | 9,600,084 | 1.82 | 1.77 | +26 | 656,590 | 944,507 | +44 |
| Pennsylvania | 22 | 22 | 40,849,602 | 42,346,830 | +4 | 40,208,800 | 69,693,517 | 41,899,787 | 72,870,981 | 1.73 | 1.74 | +4 | 2,759,021 | 3,206,064 | +16 |
| Texas | 5 | 6 | 4,565,983 | 4,858,212 | +6 | 4,488,143 | 8,322,658 | 4,735,521 | 8,729,046 | 1.85 | 1.84 | +6 | 356,212 | 478,903 | +34 |
| Washington | 4 | 4 | 1,842,113 | 2,481,923 | +35 | 1,793,403 | 4,236,554 | 2,499,237 | 5,523,324 | 2.36 | 2.21 | +39 | 289,614 | 272,300 | —6 |
| Other States* | 34 | 36 | 37,115,364 | 40,572,916 | +9 | 36,449,634 | 65,157,514 | 38,683,121 | 68,163,713 | 1.79 | 1.76 | +6 | 3,388,462 | 5,278,257 | +56 |
|  | 132 | 138 | 149,358,109 | 161,658,901 | +8 | 146,047,549 | 264,046,708 | 157,295,212 | 278,524,108 | 1.81 | 1.77 | +8 | 14,151,695 | 18,515,384 | +31 |

*Portland cement produced, shipped and in stock in the United States, 1924-25, by Districts*

| | Production | | | | | Shipments | | | | | | | Stock (Dec. 31) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Active plants | | Barrels | | Increase or decrease, 1925 (per cent) | 1924 | | 1925 | | Average factory value per barrel | | Increase or decrease in quantity, 1925 (per cent) | Barrels | | Increase or decrease, 1925 (per cent) |
| Commercial District | 1924 | 1925 | 1924 | 1925 | | Barrels | Value | Barrels | Value | 1924 | 1925 | | 1924 (revised) | 1925 | |
| Eastern Pennsylvania, New Jersey, and Maryland | 22 | 22 | 38,656,739 | 40,279,457 | +4 | 37,989,250 | $65,500,657 | 40,286,898 | $70,094,072 | $1.72 | $1.74 | +6 | 2,541,627 | 2,534,186 | —0.3 |
| New York | 9 | 9 | 7,571,856 | 8,769,584 | +16 | 7,435,875 | 13,460,089 | 8,534,089 | 14,967,642 | 1.81 | 1.75 | +15 | 792,831 | 1,028,326 | +30 |
| Ohio, western Pennsylvania, & West Virginia | 12 | 14 | 14,331,451 | 15,572,602 | +9 | 14,028,762 | 25,104,849 | 14,628,575 | 25,614,083 | 1.79 | 1.75 | +4 | 1,060,047 | 1,922,775 | +81 |
| Michigan | 15 | 16 | 9,259,781 | 10,936,181 | +18 | 8,991,270 | 16,405,761 | 10,073,453 | 17,511,908 | 1.82 | 1.74 | +12 | 2,041,760 | 3,510,364 | +72 |
| Wisconsin,** Illinois, Indiana, and Kentulky | 11 | 11 | 21,823,469 | 23,521,488 | +8 | 21,343,396 | 37,189,604 | 22,052,884 | 37,792,110 | 1.74 | 1.71 | +3 | 1,369,916 | 2,313,943 | +69 |
| Virginia, Tennessee, Alabama, and Georgia | 12 | 14 | 11,411,054 | 13,505,792 | +18 | 11,374,280 | 19,201,389 | 13,048,251 | 21,581,494 | 1.69 | 1.65 | +15 | 491,474 | 949,015 | +48 |
| Eastern Missouri, Iowa, Minnesota, and South Dakota*** | 11 | 11 | 14,822,738 | 14,571,751 | —2 | 13,984,167 | 24,757,538 | 14,477,932 | 25,317,292 | 1.77 | 1.75 | +4 | 2,737,240 | 2,831,059 | +3 |
| Western Missouri, Nebraska, Kansas, and Oklahoma | 11 | 11 | 9,892,813 | 10,672,816 | +8 | 9,586,984 | 16,262,422 | 10,524,247 | 17,772,268 | 1.70 | 1.69 | +10 | 1,507,824 | 1,656,393 | +10 |
| Texas | 5 | 6 | 4,565,983 | 4,858,212 | +6 | 4,488,143 | 8,322,658 | 4,735,521 | 8,729,046 | 1.85 | 1.84 | +6 | 356,212 | 478,903 | +34 |
| Colorado and Utah | 5 | 5 | 2,423,830 | 2,005,071 | —17 | 2,377,774 | 5,081,599 | 2,018,034 | 4,388,453 | 2.14 | 2.17 | —15 | 315,990 | 303,027 | —4 |
| California | 10 | 10 | 11,615,379 | 13,098,140 | +13 | 11,481,730 | 25,532,707 | 13,109,426 | 26,159,531 | 2.22 | 2.00 | +14 | 502,584 | 491,298 | —2 |
| Oregon, Washington, and Montana | 9 | 9 | 2,983,016 | 3,867,807 | +30 | 2.965.918 | 7.226.930 | 3.805.902 | 8 596.209 | 2.44 | 2.26 | +28 | 434.190 | 496.095 | +14 |
| | 132 | 138 | 149,358,109 | 161,658,901 | +8 | 146.047.549 | 264,046,708 | 157,295,212 | 278,524,108 | 1.81 | 1.77 | +8 | 14.151.695 | 18.515.384 | +31 |

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*Includes Colorado, Georgia, Indiana, Kentucky, Maryland, Minnesota, Montana, Nebraska, New Jersey, Oklahoma, Oregon, South Dakota, Tennessee, Utah, Virginia, West Virginia, and Wisconsin.

**Began producing and shipping in June, 1924.

***South Dakota began producing in December, 1924, and shipping in January, 1925.

## DOMESTIC CONSUMPTION

An estimate of the total consumption of Portland cement in the United States may be made by adding the imports to the shipments and subtracting the exports from the sum. Of course, at any time a variable but considerable quantity of cement is in transit, in warehouses at distributing points, and awaiting use at jobs, so that the estimate thus made is at best only approximate. Another fact that impairs the accuracy of the estimate is that the cement imported and exported is classed as hydraulic cement, hence the records do not discriminate between Portland and other cements and probably include some plaster also. Portland cement, however, constitutes by far the greater part of the exports. The apparent domestic consumption in 1925 showed an increase of 9 per cent as compared with the consumption in 1924.

*Portland cement available for consumption in the United States, 1916-1925, in barrels*

| Year | Shipments | Imports | Exports | Available for consumption |
|---|---|---|---|---|
| 1916 | 94,552,296 | 1,836 | 2,563,976 | 91,990,156 |
| 1917 | 90,703,474 | 2,323 | 2,586,215 | 88,119,582 |
| 1918 | 70,915,508 | 305 | 2,252,446 | 68,663,367 |
| 1919 | 85,612,899 | 8,931 | 2,463,573 | 83,158,257 |
| 1920 | 96,311,719 | 524,604 | 2,985,807 | 93,850,516 |
| 1921 | 95,507,147 | 122,322 | 1,181,014 | 94,448,455 |
| 1922 | 117,701,216 | 323,823 | 1,127,845 | 116,897,194 |
| 1923 | 135,912,118 | 1,678,636 | 1,001,688 | 136,589,066 |
| 1924 | 146,047,549 | 2,010,936 | 878,543 | 147,179,942 |
| 1925 | 157,295,212 | 3,655,317 | 1,019,597 | 159,930,932 |

Furthermore, the estimates of consumption of Portland cement by States are merely approximate because they are based on the records of shipments by manufacturers into the several States. Such shipments do not equal the consumption in that State during the same year, but shipments over a long period should afford a fair index of consumption. The simplest available common unit is the estimated consumption, in barrels per capita, which is obtained by comparing the shipments into the several States with the population of those States. The following table shows such figures for 1924 and 1925. The estimates of population used in calculating the per capita consumption are those of the Bureau of the Census.

The official figures for exports of cement differ from the exports reported by manufacturers, as shown in the following table, because cement forwarded from mills and destined for foreign countries and for Alaska, Hawaii, and Porto Rico is reported by the shipper as exported, whether or not it leaves the country during the calendar year; but the Bureau of Foreign and Domestic Commerce bases its export figures on its records of the cement that actually leaves the country. The exports given by that bureau for 1925 include all other hydraulic cement exported, whereas the table of per capita consumption relates only to Portland cement.

The per capita consumption shown by the table necessarily falls short of the total apparent consumption by the quantity of the imports. These increase the consumption in certain States near the Canadian border and the seaboard; in 1925 they increased the general average per capita consumption by about 0.032 barrel.

There were 28 States in which the per capita consumption in 1925 was 1 barrel or more—13 of them west and 15 of them east of Mississippi River. Two of them, Florida and North Carolina, are Southern States.

Florida showed the highest per capita consumption for the year, a noteworthy result of the great amount of construction work in progress in that State. In 1921 the per capita consumption of Florida was 0.66 barrel, higher than in any preceding year for which official statistics of per capita consumption were published. Each year following showed an increase until in 1925 the consumption was 3.28 barrels, and Florida displaced California which held the record for the four preceding years. In 1925 California followed Florida closely with a per capita consumption of 3.09 barrels. There were three other States—Michigan, Illinois, and New Jersey—in which the per capita consumption in 1925 was 2 barrels or more.

The States of Florida, Missouri, Washington, California, and the District of Columbia showed, in the order named, the largest per capita increases of the year. All the States except Arizona showed changes—32 showed increases and 16 decreases. The general average consumption for the United States was 1.38 barrels as compared with 1.29 barrels in 1924. This is the highest average per capita consumption ever recorded, as the range from 1914 to 1924 was from 0.64 to 1.29 barrels.*

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*Data on per capita consumption of Portland cement by States, beginning with the year 1914, are given in preceding volumes of Mineral Resources.

*Shipments of domestic Portland cement from mills into States and per capita, 1924-25, in barrels**

| State | 1924 | | 1925 | |
|---|---|---|---|---|
| | Total | Per capita* | Total | Per capita* |
| Alabama | 1,872,997 | 0.76 | 2,084,922 | 0.85 |
| Arizona** | 415,146 | 1.04 | 423,523 | 1.04 |
| Arkansas** | 1,084,020 | .59 | 800,407 | .43 |
| California | 10,846,703 | 2.73 | 12,433,619 | 3.09 |
| Colorado | 1,337,466 | 1.32 | 1,152,498 | 1.13 |
| Connecticut** | 1,582,312 | 1.04 | 1,758,443 | 1.15 |
| Delaware** | 385,581 | 1.65 | 401,923 | 1.71 |
| District of Columbia** | 722,960 | 1.47 | 886,236 | 1.78 |
| Florida** | 2,177,233 | 2.02 | 4,150,091 | 3.28 |
| Georgia | 1,408,106 | .46 | 1,438,009 | .47 |
| Iraho** | 262,422 | .54 | 258,553 | .53 |
| Illinois | 13,328,219 | 1.93 | 14,404,947 | 2.07 |
| Indiana | 5,522,818 | 1.81 | 4,997,971 | 1.63 |
| Iowa | 3,144,001 | 1.26 | 2,704,872 | 1.08 |
| Kansas | 2,142,725 | 1.18 | 2,257,447 | 1.25 |
| Kentucky | 1,763,538 | .71 | 1,796,397 | .72 |
| Louisiana** | 1,260,231 | .67 | 1,100,099 | .59 |
| Maine** | 386,593 | .49 | 333,829 | .43 |
| Maryland | 1,989,182 | 1.30 | 2,127,479 | 1.38 |
| Massachusetts** | 3,359,553 | .82 | 3,418,028 | .83 |
| Michigan | 9,355,024 | 2.28 | 9,564,976 | 2.31 |
| Minnesota | 3,248,369 | 1.28 | 3,615,328 | 1.41 |
| Mississippi** | 527,046 | .29 | 579,239 | .32 |
| Missouri | 3,985,049 | 1.15 | 5,600,510 | 1.62 |
| Montana | 202,782 | .32 | 235,525 | .36 |
| Nebraska | 1,499,998 | 1.11 | 1,674,944 | 1.24 |
| Nevada** | 91,821 | 1.19 | 100,997 | 1.30 |
| New Hampshire** | 378,554 | .84 | 426,138 | .95 |
| New Jersey | 6,410,037 | 1.84 | 7,082,207 | 2.02 |
| New Mexico** | 231,970 | .61 | 181,927 | .48 |
| New York | 17,456,377 | 1.58 | 18,488,762 | 1.66 |
| North Carolina** | 2,999,559 | 1.09 | 3,024,621 | 1.10 |
| North Dakota** | 248,732 | .36 | 341,841 | .50 |
| Ohio | 9,262,652 | 1.48 | 9,221,005 | 1.46 |
| Oklahoma | 2,210,586 | 1.00 | 2,377,673 | 1.06 |
| Oregon | 1,211,462 | 1.44 | 1,318,163 | 1.56 |
| Pennsylvania | 12,964,163 | 1.40 | 14,932,787 | 1.60 |
| Rhode Island** | 608,355 | .96 | 711,391 | 1.05 |
| South Carolina** | 570,631 | .32 | 864,166 | .49 |
| South Dakota*** | 466,725 | .70 | 461,726 | .68 |
| Tennessee | 1,558,825 | .65 | 1,644,029 | .68 |
| Texas | 3,853,698 | .76 | 4,188,910 | .82 |
| Utah | 427,825 | .88 | 381,018 | .77 |
| Vermont** | 300,102 | .85 | 217,286 | .62 |
| Virginia | 1,701,408 | .70 | 1,648,744 | .67 |
| Washington | 1,730,483 | 1.18 | 2,427,263 | 1.64 |
| West Virginia | 1,661,042 | 1.05 | 1,487,663 | .93 |
| Wisconsin | 4,515,256 | 1.62 | 4,105,100 | 1.47 |
| Wyoming** | 331,309 | 1.51 | 225,170 | 1.01 |
| Unspecified | 59,809 | | 59,272 | |
| | 145,061,545 | 1.29 | 156,117,674 | 1.38 |
| Exports reported by manufacturers but not included above**** | 986,004 | | 1,177,538 | |
| Total shipped from cement plants | 146,047,549 | | 157,295,212 | |

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*Per capita figures based on estimate of population made by the Bureau of the Census.
**Noncement-producing State.
***South Dakota began shipping January, 1925.
****Includes shipments to Alaska, Hawaii, and Porto Rico.

### LOCAL SUPPLIES

The following table compares the shipments from the mills within a State or group of States with the estimated consumption (State distribution of mill shipments) and indicates the surplus or deficiency in the supply of cement locally available. Consumption in the States that do not produce cement is also indicated in the preceding table. Data for 1916 to 1923 will be found in Mineral Resources of the United States for 1917 to 1923.

The surplus shown in the following table was distributed, by years, as follows: In 1924, to noncement-producing States, 18,390,855 barrels; to foreign countries and to Alaska, Hawaii, and Porto Rico, 986,004 barrels; unspecified, 59,809 barrels; in 1925, to noncement-producing States, 20,203,908 barrels; to foreign countries and to Alaska, Hawaii, and Porto Rico, 1,177,538 barrels; unspecified, 59,272 barrels.

Among the cement-producing States there are, of course, fewer deficiencies than surpluses, and certain of the deficiencies indicated are due to local conditions that did not change materially from 1924 to 1925. For instance, in 1925 Ohio showed a deficiency of more than 3,794,000 barrels, which was largely supplied from Pennsylvania's surplus of 27,000,000 barrels and from Indiana. New York, though a large producer, had a deficiency of nearly 10,000,000 barrels that was mostly supplied from the near-by Lehigh district in Pennsylvania. In Maryland, New Jersey, and West Virginia there was a shortage of more than 3,100,000 barrels, which was probably supplied in large part from the Lehigh district. The quantities consumed in the non-producing States are of interest in comparison with the other data. Between 500,000 and 1,000,000 barrels were consumed in 1925 in each of the States of Arkansas, Mississippi, Rhode Island, and South Carolina, and in the District of Columbia. Louisiana consumed more than 1,100,000 barrels, Connecticut more than 1,758,000 barrels, North Carolina more than 3,000,000 barrels, Massachusetts more than 3,400,000 barrels, and Florida more than 4,510,000 barrels.

*Estimated surplus or deficiency in local supply of Portland cement in cement-producing States. 1924-25 in barrels*

| State or division | 1924 | | | 1925 | | |
|---|---|---|---|---|---|---|
| | Shipments from mills | Estimated consumption | Surplus or deficiency | Shipments from mills | Estimated consumption | Surplus or deficiency |
| Alabama | 5,542,687 | 1,872.997 | +3,669,690 | 6,045,967 | 2,084,922 | +3,961,045 |
| California | 11,481,730 | 10,846.703 | +635,027 | 13,109,426 | 12,433,619 | +675,807 |
| Illinois | 6,955,455 | 13,328,219 | —6,372,764 | 6,749,532 | 14,404,947 | —7,655,415 |
| Iowa | 4,881,613 | 3,144,001 | +1,737,612 | 4,856,849 | 2,704,872 | +2,151,977 |
| Kansas | 5.809,646 | 2,142,725 | +3,666,921 | 6,513,297 | 2,257,447 | +4,255,850 |
| Michigan | 8.991,270 | 9,355,024 | —363,754 | 10,073,453 | 9,564,976 | +508,477 |
| Missouri | 7,711,206 | 3,985,049 | +3,726,157 | 8,168,165 | 5,600,510 | +2,567,655 |
| New York | 7,435,875 | 17,456,377 | —10,020,502 | 8,534,089 | 18,488,762 | —9,954,673 |
| Ohio | 4,298,027 | 9,262,652 | —4,964,625 | 5,426,768 | 9,221,005 | —3,794,237 |
| Pennsylvania | 40,208,860 | 12,964,163 | +27,244,697 | 41,899,787 | 14,932,787 | +26,967.000 |
| Texas | 4.488,143 | 3,853,698 | +634,445 | 4,735,521 | 4,188,910 | +546,611 |
| Colorado and Utah | 2,377,774 | 1,765,291 | +612,483 | 2,018,034 | 1,533,516 | +484,518 |
| Oregon, Washington, and Montana | 2,965,918 | 3,144,727 | —178,809 | 3,805,902 | 3,980,951 | —175,049 |
| Georgia, Kentucky, Tennessee, and Virginia | 6,551,628 | 6,431,877 | +119,751 | 7,721,210 | 6,527,179 | +1,194,031 |
| Indiana, Wisconsin, Minnesota, Nebraska, Oklahoma, and South Dakota* | 18,836,592 | 16,997,027 | +1,839,565 | 20,048,294 | 17,232,742 | +2,815,552 |
| Maryland, New Jersey, and West Virginia | 7,511,125 | 10,060,261 | —2,549,136 | 7,588,918 | 10,697,349 | —3,108,431 |
| | 146,047,549 | 126,610,791 | +19,436,758 | 157,295,212 | 135,854,494 | +21,440,718 |

*South Dakota began shipping in January, 1925.

## PRICES

### AT FACTORIES

Average values of Portland cement sold at the factories as reported to the Bureau of Mines are shown in the tables of shipments by States and districts during 1924 and 1925 (pp. 258 and 259). The averages by districts ranged from $1.65 a barrel in the Virginia-Tennessee-Alabama-Georgia district to $2.26 in the Oregon-Washington-Montana district in 1925, as compared with a range from $1.69 in the Virginia-Tennessee-Alabama-Georgia district to $2.44 in the Oregon-Washington-Montana district in 1924. The general average value for the whole country showed a decrease in 1925 of more than 2 per cent, and averages were lower in all the districts except Colorado-Utah and eastern Pennsylvania-New Jersey-Maryland, and in all the States except Colorado, Maryland, Montana, Oklahoma, Pennsylvania, and Utah.

For certain States the average factory value of Portland cement may be slightly higher than it would be if the ordinary structural cement were the only kind considered in the average. This is due to the marketing of certain special cements that command a higher price. Among these are the white Portland cement made in Pennsylvania and also the cements particularly intended for shutting out water in oil wells and for stucco finish, both of which are made in California. Oil wells require a rapid-setting cement, and for stucco a cement should be more than ordinarily plastic and waterproof.

### AT MARKETS

The next table summarizes the wholesale prices of Portland cement in bulk in carload lots at the principal cities of the United States and at Montreal, Canada, for 1924 and 1925, by months, as published in the Engineering News-Record. Seeming inconsistencies in the table, such as sudden large changes in prices, suggest the inclusion of delivery charges that the explanatory footnote does not account for. The price figures may be compared in several different ways. Prices at a single locality for corresponding months in 1924 and 1925 and for the several months of the same year can readily be compared and also prices at different localities. As with factory values, the net movement of market prices in 1925, as in 1924, was downward; the decreases ranged from 2 to 92 cents a barrel.

*Average factory value per barrel in bulk of Portland cement, 1914-1925*

| | | | | | |
|---|---|---|---|---|---|
| 1914 | $0.93 | 1918 | $1.60 | 1922 | $1.76 |
| 1915 | .86 | 1919 | 1.71 | 1923 | 1.90 |
| 1916 | 1.10 | 1920 | 2.02 | 1924 | 1.81 |
| 1917 | 1.35 | 1921 | 1.89 | 1925 | 1.77 |

At a few of the cities, as Dallas, Denver, Jersey City, New Orleans, and Philadelphia, the prices throughout the year 1925 seem to have remained the same as in 1924. In others, as Chicago, Duluth, Minneapolis, Pittsburgh, and St. Paul, prices remained the same during the first 10 months of 1925 as in 1924 but declined in November and December. In these two months lower prices seem to have been almost general. At Birmingham, Dallas, Denver, Jersey City, Montreal, New Orleans, Philadelphia, Seattle, also at New York except for an increase in the delivered price in December, prices remained stationary. The three Pacific coast cities showed lower prices in 1925 than in 1924. At Los Angeles prices were lower each month; at Seattle and San Francisco they were lower except for from two to three months, when they remained the same as in 1924. At Boston and Detroit prices for January were higher in 1925 than in 1924 but showed decreases the rest of the year. From January to July but two to eight cities showed increases over the corresponding months in 1924; in July, August, and December only one showed increase; from September to November no increase is shown. As might be expected, the lowest market prices were quoted at cities near which Portland cement is manufactured, such as Duluth, Chicago, Pittsburgh, Kansas City, St. Louis, and Dallas, but there are other cities where the proximity of cement mills might be expected to bring about prices lower than those in the table. In New York two scales of prices are quoted, the higher for cement delivered, the lower for cement alongside dock.

The differences between average factory values for 1924 and 1925, by districts, and the market prices of cement at the principal cities within the several districts do not seem excessive in view of all the elements that enter into these differences. In 1924 the differences ranged from 20 cents to $1.18 a barrel and in 1925 from 21 cents to $1.16 a barrel. In most districts these differences were less than 75 cents a barrel in both years.

The increase in the prices of building materials and of all other commodities since the beginning of the World War has so seriously affected living conditions that many inquiries into the price situation have naturally followed. As the annual per capita consumption of Portland cement in the United States has reached nearly 1 2/5 barrels and promises to continue to increase, the prices of such an essential building material have attracted particular interest. Considerable information is now available to show the position of cement prices among those of other structural materials and to explain the economic conditions that determine them. Data of interest in this connection are compiled and published by the United States Bureau of Labor Statistics, Department of Labor.

## *Wholesale prices of Portland cement per barrel in bulk in carload lots, 1924-25, by months**

| City | January | | February | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 |
| Atlanta | $2.35 | $2.35 | $2.35 | $2.35 | $2.35 | $2.30 | $2.35 | $2.30 | $2.35 | $2.30 | $2.35 | $2.30 |
| Baltimore | 2.50 | 2.50 | 2.50 | 2.90 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 |
| Birmingham | 2.80 | 2.40 | 2.80 | 2.40 | 2.80 | 2.40 | 2.65 | 2.40 | 2.65 | 2.40 | 2.65 | 2.40 |
| Boston | 2.63 | 2.67½ | 2.63 | 2.60 | 2.63 | 2.55 | 2.65 | 2.55 | 2.63 | 2.55 | 2.65 | 2.55 |
| Cedar Rapids | 2.38 | 2.38 | 2.40 | 2.44 | 2.40 | 2.44 | 2.40 | 2.44 | 2.40 | 2.44 | 2.40 | 2.44 |
| Chicago | 2.10 | 2.10 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| Cincinnati | 2.41 | 2.37 | 2.37 | 2.47 | 2.37 | 2.47 | 2.47 | 2.47 | 2.47 | 2.47 | 2.47 | 2.47 |
| Cleveland | 2.41 | 2.39 | 2.41 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 |
| Dallas | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 |
| Davenport | 2.29 | 2.29 | 2.29 | 2.39 | 2.29 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 |
| Denver | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 |
| Detroit | 2.37 | 2.40 | 2.37 | 2.35 | 2.40 | 2.35 | 2.40 | 2.35 | 2.40 | 2.35 | 2.40 | 2.35 |
| Duluth | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 |
| Indianapolis | 2.31 | 2.31 | 2.31 | 2.41 | 2.31 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 |
| Jersey City | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 |
| Kansas City | 2.27 | 2.07 | 2.20 | 2.30 | 2.10 | 2.07 | 2.30 | 2.28 | 2.27 | 2.28 | 2.27 | 2.28 |
| Los Angeles | 3.16 | 2.60 | 3.16 | 2.80 | 3.00 | 2.80 | 3.00 | 2.80 | 3.00 | 2.80 | 3.00 | 2.80 |
| Milwaukee | 2.25 | 2.25 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 |
| Minneapolis | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 |
| Montreal | 2.25 | 1.80 | 2.25 | 1.80 | 2.72 | 1.80 | 2.72 | 1.80 | 2.72 | 1.80 | 2.25 | 1.80 |
| New Orleans | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 |
| New York (delivered) | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 |
| New York (alongside dock to dealers) | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 |
| Peoria | 2.27 | 2.27 | 2.27 | 2.37 | 2.27 | 2.37 | 2.37 | 2.37 | 2.37 | 2.37 | 2.37 | 2.37 |
| Philadelphia | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 |
| Pittsburgh | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 |
| St. Louis | 2.20 | 2.20 | 2.20 | 2.30 | 2.20 | 2.30 | 2.20 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 |
| St. Paul | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 |
| San Francisco | 2.61 | 2.61 | 2.61 | 2.61 | 2.61 | 2.61 | 2.61 | 2.31 | 2.61 | 2.31 | 2.61 | 2.31 |
| Seattle | 2.90 | 2.65 | 2.90 | 2.65 | 2.90 | 2.65 | 2.90 | 2.65 | 2.90 | 2.65 | 2.90 | 2.65 |
| Toledo | 2.38 | 2.36 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.45 | 2.40 | 2.45 | 2.40 |

| City | July | | August | | September | | October | | November | | December | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 |
| Atlanta | $2.35 | $2.40 | $2.35 | $2.40 | $2.35 | $2.25 | $2.35 | $2.25 | $2.35 | $2.25 | $2.35 | $2.35 |
| Baltimore | 2.50 | 2.50 | 2.50 | 2.50 | 2.90 | 2.50 | 2.90 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 |
| Birmingham | 2.65 | 3.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 |
| Boston | 2.63 | 2.50 | 2.64 | 2.45 | 2.64 | 2.45 | 2.70 | 2.40 | 2.70 | 2.40 | 2.67½ | 2.40 |
| Cedar Rapids | 2.44 | 2.44 | 2.44 | 2.44 | 2.44 | 2.44 | 2.44 | 2.44 | 2.44 | 2.34 | 2.44 | 2.34 |
| Chicago | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.10 | 2.20 | 2.10 |
| Cincinnati | 2.47 | 2.47 | 2.47 | 2.47 | 2.47 | 2.47 | 2.47 | 2.47 | 2.47 | 2.37 | 2.47 | 2.37 |
| Cleveland | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.29 | 2.39 | 2.29 |
| Dallas | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 | 2.05 |
| Davenport | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.39 | 2.29 | 2.39 | 2.29 |
| Denver | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 | 2.84 |
| Detroit | 2.40 | 2.35 | 2.40 | 2.35 | 2.40 | 2.35 | 2.40 | 2.35 | 2.40 | 2.15 | 2.40 | 2.15 |
| Duluth | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.09 | 2.19 | 2.09 |
| Indianapolis | 2.41 | 2.41 | 2.41 | 2.39 | 2.41 | 2.39 | 2.41 | 2.39 | 2.41 | 2.29 | 2.41 | 2.29 |
| Jersey City | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 |
| Kansas City | 2.27 | 2.20 | 2.82 | 2.30 | 2.70 | 2.30 | 2.70 | 2.30 | 2.42 | 2.30 | 2.07 | 2.30 |
| Los Angeles | 3.00 | 2.52 | 2.75 | 2.52 | 2.83 | 2.52 | 2.98 | 2.52 | 2.60 | 2.52 | 2.60 | 2.52 |
| Milwaukee | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.25 |
| Minneapolis | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.32 | 2.42 | 2.32 |
| Montreal | 1.90 | 1.80 | 1.90 | 1.80 | 1.90 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 |
| New Orleans | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 |
| New York (delivered) | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.60 | 2.50<br>2.70 |
| New York (alongside dock to dealers) | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 |
| Peoria | 2.37 | 2.37 | 2.37 | 2.37 | 2.37 | 2.37 | 2.37 | 2.37 | 2.37 | 2.27 | 2.37 | 2.27 |
| Philadelphia | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 | 2.41 |
| Pittsburgh | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.19 | 2.09 | 2.19 | 2.09 |
| St. Louis | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 2.20 | 2.30 | 2.20 |
| St. Paul | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.42 | 2.32 | 2.42 | 2.32 |
| San Francisco | 2.61 | 2.31 | 2.61 | 2.31 | 2.61 | 2.31 | 2.61 | 2.31 | 2.61 | 2.31 | 2.61 | 2.31 |
| Seattle | 2.90 | 2.65 | 2.90 | 2.65 | 2.90 | 2.65 | 2.90 | 2.65 | 2.65 | 2.65 | 2.65 | 2.65 |
| Toledo | 2.45 | 2.40 | 2.45 | 2.40 | 2.45 | 2.40 | 2.45 | 2.40 | 2.45 | 2.20 | 2.45 | 2.20 |

*Engineering News-Record. Prices quoted are f. o. b. points listed, without bags; cash discount not deducted.

*Comparative prices of building materials in December, 1924 and 1925**

(Percentage of increase over prices in 1913)

| | 1924 | 1925 |
|---|---|---|
| Building materials in general | 75.1 | 77.0 |
| Lime (lump), average, 15 plants | 126.9 | 122.1 |
| Plate glass, 3 to 5 feet, New York | 81.7 | 69.0 |
| Turpentine, New York | 95.6 | 137.7 |
| Brick, common, simple average at 82 brickyards | 109.6 | 104.7 |
| Linseed oil, New York | 139.1 | 105.0 |
| Douglas fir, No. 1, common, at mills | 79.2 | 68.3 |
| Yellow-pine flooring, B and better, at mills | 92.8 | 116.3 |
| Oak, plain white, No. 1, Cincinnati | 72.4 | 78.4 |
| Portland cement, simple average at 6 representative plants | 75.4 | 68.4 |

*U. S. Department of Labor, Bureau of Labor Statistics, Wholesale Prices of Commodities, pp. 7-8 of report for December, 1925.

*Portland cement manufacturing capacity of the United States by commercial districts, 1294-25*

| District | Estimated capacity (barrels) | | Percentage of capacity utilized | |
|---|---|---|---|---|
| | 1924 | 1925 | 1924 | 1925 |
| Eastern Pennsylvania, New Jersey, and Maryland | 43,831,000 | 43,607,000 | 88.2 | 92.4 |
| New York | 9,107,000 | 10,199,000 | 83.1 | 86.0 |
| Ohio, Western Pennsylvania, and West Virginia | 16,289,000 | 19,144,000 | 88.0 | 81.3 |
| Michigan | 11,501,000 | 15,301,000 | 80.5 | 71.5 |
| Wisconsin, Illinois, Indiana, and Kentucky | 23,532,000 | 26,091,000 | 92.7 | 90.2 |
| Virginia, Tennessee, Alabama, and Georgia | 12,889,000 | 15,792,000 | 88.5 | 85.5 |
| Eastern Missouri, Iowa, Minnesota, and South Dakota | 17,675,000 | 18,942,000 | 83.9 | 76.9 |
| Western Missouri, Nebraska, Kansas, and Oklahoma | 12,202,000 | 13,240,000 | 81.1 | 80.6 |
| Texas | 5,175,000 | 5,880,000 | 88.2 | 82.6 |
| Colorado and Utah | 3,205,000 | 3,275,000 | 75.6 | 61.2 |
| California | 14,727,000 | 16,395,090 | 78.9 | 79.9 |
| Oregon, Washington, and Montana | 4,967,000 | 5,692,000 | 60.1 | 68.0 |
| | 175,100,000 | 193,558,000 | 85.3 | 83.5 |

## MASONRY, NATURAL, AND PUZZOLAN CEMENTS

The term "masonry cement" is used here to designate certain cements made, like natural cements, by grinding calcined calcareous rock, that are being used largely in mortar for laying brick and stone, although, of course, other hydraulic cements are also suitable for masonry.

Natural cement, including masonry cement, was produced in 1925 in nine plants, situated as follows: Near Rosendale, N. Y.; Siegfried, Pa.; Lisbon, Ohio; Speeds, Ind.; Utica, Ill.; Fort Scott, Kans.; Kosmosdale, Ky.; and Austin and Mankota, Minn.

One manufacturer with a plant at Birmingham, Ala., reports an output of puzzolan or slag-lime cement, and in order that this output may be included in the cement totals for the United States without revealing confidential information it is included with the statistics of masonry and natural cements.

The next table, which gives figures on the output of masonry, natural, and puzzolan cements in 1924 and 1925, indicates an increase in quantity of 23.5 per cent and in value of 27.2 per cent, as compared with the output in 1924. The average factory value per barrel in 1925 was $1.46, compared with $1.41 in 1924. The output has been expressed in terms of 376-pound barrels, to correspond with the statistics for Portland cement.

At the end of 1925 an additional plant to manufacture natural cement was reported under construction at Akron, N. Y.

The second table presents quoted wholesale prices of these cements in lots of 500 barrels or more, exclusive of bags, f. o. b. at a number of widely separated cities in the United States, as published by the Engineering News-Record; but in order to make a consistent comparison of these prices the reader should note that barrels of 240, 250, 265, 300, 320, and 340 pounds are involved instead of the standard Portland cement barrel of 376 pounds. These cements are packed four sacks to the barrel, each sack holding about 1 cubic foot, as with Portland cement, but the lower specific gravity of the non-Portland cements accounts for their lighter weight per barrel.

*Masonry, natural, and puzzolan cements shipped from plants in the United States 1294-25*

| State | 1924 | | | 1925 | | |
|---|---|---|---|---|---|---|
| | Producing plants | Barrels of 376 pounds | Value | Producing plants | Barrels of 376 pounds | Value |
| Alabama* | 1 | 745,369 | $1,147,088 | 1 | 939,062 | $1,491,333 |
| Illinois | 1 | | | 1 | | |
| Indiana | 1 | | | 1 | | |
| Kansas | 1 | 673,092 | 859,471 | 1 | 812,663 | 1,060,250 |
| Kentucky | 1 | | | 1 | | |
| Minnesota | 2 | | | 2 | | |
| New York | 1 | | | 1 | | |
| Ohio | 1 | | | 1 | | |
| Pennsylvania | 1 | | | 1 | | |
| | 10 | 1,418.461 | 2.006,559 | 10 | 1.751,725 | 2.551,583 |

*Puzzolan only.

### *Wholesale prices of masonry, natural, and puzzolan cements, 1924-25, by months**

(Per barrel except as otherwise noted**)

| City and brand | January | | February | | March | | April | |
|---|---|---|---|---|---|---|---|---|
| | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 |
| Birmingham (Magnolia) | $2.10 | $2.25 | $2.10 | $2.40 | $2.10 | $2.40 | $2.10 | $2.40 |
| Boston (Rosendale) | 2.80 | 2.50 | 2.65 | 2.50 | 2.70 | 2.50 | 2.70 | 2.50 |
| Cincinnati (Utica) | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 |
| Kansas City (Fort Scott) | 1.50 | 1.50 | 1.75 | 1.50 | 1.80 | 1.50 | 1.80 | 1.35 |
| Minneapolis (Rosendale) | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 |
| St. Louis (Carney) | 2.25 | 2.35 | 2.45 | 2.35 | 2.45 | 2.35 | 1.95 | 2.35 |

| City and brand | May | | June | | July | | August | |
|---|---|---|---|---|---|---|---|---|
| | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 |
| Birmingham (Magnolia) | $2.10 | $2.40 | $2.10 | $2.40 | $2.10 | $2.40 | $2.10 | $2.40 |
| Boston (Rosendale) | 2.60 | 2.50 | 2.60 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 |
| Cincinnati (Utica) | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 |
| Kansas City (Fort Scott) | 1.80 | 1.35 | 1.80 | 1.35 | 1.80 | 1.35 | 1.50 | 1.35 |
| Minneapolis (Rosendale) | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 |
| St. Louis (Carney) | 1.95 | 2.35 | 2.45 | 2.30 | 2.45 | 2.30 | 2.35 | 2.30 |

| City and brand | September | | October | | November | | December | |
|---|---|---|---|---|---|---|---|---|
| | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 |
| Birmingham (Magnolia) | $2.10 | $2.40 | $2.10 | $2.40 | $2.10 | $2.40 | $2.25 | $2.40 |
| Boston (Rosendale) | 2.50 | 2.75 | 2.50 | 2.75 | 2.50 | 2.75 | 2.50 | 2.75 |
| Cincinnati (Utica) | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 | 1.72 |
| Kansas City (Fort Scott) | 1.50 | 1.65 | 1.35 | 1.45 | 1.50 | 1.35 | 1.50 | 1.35 |
| Minneapolis (Rosendale) | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 |
| St. Louis (Carney) | 2.35 | 2.35 | 2.35 | 2.35 | 2.35 | 2.50 | 2.35 | 2.50 |

*Engineering News-Record. Price to dealers per barrel for 500 barrels or more f. o. b., exclusive of bags; unless otherwise designated.

**Available information indicates that the weights per barrel of these cements are as follow: Rosendale, 320 pounds . Utica, 265 pounds; Fort Scott, 240 pounds; Carney, 250 pounds; Magnolia (puzzolan cement), 320 pounds.

## PRODUCERS

National Cement Co., Ragland, Alabama. Plant at Ragland, St. Clair County.

Southern Cement Co., Birmingham, Alabama. Plant at North Birmingham, Jefferson County.

Atlas Portland Cement Co., 25 Broadway, New York City. Plant at Leeds, Jefferson County.

Alabama Portland Cement Co. Plant at North Birmingham, Jefferson County.

Lehigh Portland Cement Co. Plant at Tarrant City, near North Birmingham, Jefferson County.

Warrior Cement Co., Demopolis, Alabama. Plant at Spocari, Marengo County.

# CLAY

By Jefferson Middleton

*Domestic Clay Sold in Alabama in 1924 and 1925*

| | Number of operators reporting sales | Kaolin, china clay and paper clay | | Ball clay | | Fire clay | | Stoneware clay | | Miscellaneous | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value |
| 1924 | 12 | ........ | ........ | 100 | $400 | 66,293 | $101,294 | 74 | $110 | ........ | ........ | 86,939 | $120,945 |
| 1925 | 14 | ........ | ........ | ........ | ........ | 80,968 | $143,622 | 20,546 | $18,621 | 26,298 | $25,579 | 107,340 | $169,311 |

## *Production of Clay in Alabama from 1911 to 1925*

| Year | Fire clay | | Miscellaneous clay | | Total | |
|---|---|---|---|---|---|---|
| | Quantity Short tons | Value | Quantity Short tons | Value | Quantity Short tons | Value |
| 1911 | 35,203 | $29,909 | ------ | ------ | 35,203 | $29,909 |
| 1912 | 35,552 | 31,414 | 4,500 | $2,000 | 43,052 | 33,414 |
| 1913 | 49,901 | 53,629 | * | * | 49,901 | 53,419 |
| 1914 | 27,973 | 34,607 | ------ | ------ | 27,973 | 34,607 |
| 1915 | 31,520 | 34,882 | * | * | 31,870 | 35,232 |
| 1916 | 40,235 | 50,618 | 1,244 | 435 | 41,479 | 51,053 |
| 1917 | 41,951 | 67,674 | ------ | ------ | 58,667 | 84,763 |
| 1918 | 49,516 | 48,611 | 532 | 582 | 50,048 | 49,193 |
| 1919 | 49,372 | 46,497 | 19,931 | 28,641 | 69,303 | 75,138 |
| 1920 | 45,612 | 51,220 | 1,900 | 39,790 | 47,512 | 91,010 |
| 1921 | 45,520 | 38,077 | 1,332 | 10,659 | 46,852 | 48,736 |
| 1922 | 55,483 | 44,355 | 4,820 | 4,750 | 60,523 | 49,765 |
| 1923 | 77,440 | 108,478 | 13,178 | 9,941 | 90,618 | 118,419 |
| 1924 | 66,293 | 101,924 | 20,646 | 19,021 | 86,939 | 120,945 |
| 1925 | 80,968 | 143,622 | 26,372 | 25,689 | 107,340 | 169,311 |

*Not divulged but included in total.

## PRODUCERS

### Bibb County

Bibbville Fire Brick & Mfg. Co.

### Blount County

Priestley Toulmin, Jr.

### Cullman County

Cullman Brick Co.

### DeKalb County

Southern Refractories & Kaolin.

### Franklin County

Spruce Pine Sand & Gravel Co.

### Jefferson County

Alabama Clay Products Co.
Bibby Coal Shale & Clay Co., Inc.
Birmingham Clay Products Co.
Harbison-Walker Refractories.
Imperial Coal & Coke Co.
Robertson Brick Co.

### Talladega County

Anniston Refractories Co.

### Tuscaloosa County

M. C. Shackleford.

## *Production of Clay Products in Alabama in 1923-1925*

| Product | 1923 |  |  | 1924 |  |  |  | 1925 |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Number of Establishments | Quantity | Value | Number of Establishments | Quantity | Value | Average Unit Value | Number of Establishments | Quantity | Value |
| Common brick | ---- | 123,475,000 | $1,279,859 | 34 | 140,717,000 | $1,418,664 | $10.08 | *** | *** | *** |
| Vitrified paving brick | ---- | ---- | ---- | 3 | 19,582,000 | 468,633 | 23.93 | *** |  |  |
| Face brick | ---- | 24,694,000 | 420,058 | 6 | 22,131,000 | 403,963 | 18.25 | *** |  |  |
| Hollow building tile* | ---- | 46,016<br>(tons) | 426,712 | 7 | 48,808<br>(tons) | 385,300 | 7.46<br>(ton) | *** |  |  |
| Fire brick | ---- | 19,913,000 | 692,704 | 3 | 12,868,000 | 530,805 | 41.25 | *** |  |  |
| Red earthenware | ---- | ---- | 2,090 | 5 | ---- | 6,718 | ---- |  |  |  |
| Miscellaneous** | ---- | ---- | 1,587,920 | 11 | ---- | 1,438,231 | ---- | *** |  |  |
| Total (brick, tile, etc.)† | ---- | ---- | ---- | 41 | ---- | $4,638,596 | ---- | 44 | *** | $4,987,896 |
| (Pottery) | ---- | ---- | ---- | 5 | ---- | 13,712 | ---- | *** | *** | 7,575 |
| Combined total | 45 | ---- | $4,409,371 | 46 | ---- | $4,652,308 | ---- | *** | *** | $4,980,321 |

*Partition, load-bearing, back-up, blocks, furring, book-tile.

**Includes floor arch, silo tile, corn-crib tile, conduits, radial chimney blocks, fire-proofing, roofing tile, vitrified brick or block, drain tile, sewer pipe, silica brick, refractory cement, stoneware (except chemical) and yellow and Rockingham ware, and clay sold raw or prepared—all combined to conceal confidential information.

†Total number of establishments producing. Itemized list counts establishments for each product.

***Separate figures not available.

# COAL

## INTRODUCTORY

By WALTER B. JONES

THE great Appalachian coal region furnishes over two-thirds of the coal production of the United States and extends from Ohio and Pennsylvania on the north in a gradually narrowing belt through Eastern Kentucky and Tennessee with its southern terminus in a considerably broadened area that occupies a large part of the northern half of Alabama. The coal-bearing formations of Alabama underlie about 8,400 square miles and are divided into four distinct basins, the Coosa, the Cahaba and the Warrior, named from the rivers which drain them, and the Plateau which includes Blount, Lookout and Sand or Raccoon Mountains. By far the most important basin in area and in production is the Warrior, which includes all of Walker County, most of Jefferson, Tuscaloosa and Fayette Counties, and smaller parts of Blount, Cullman, Winston and Marion Counties. The area known to contain coal is approximately 4,000 square miles, or one-half the total coal area of the State, and contributes about 85 per cent of the total production.

There are several distinct coal groups in the basin, the most important of which are the Brookwood, the Pratt and the Mary Lee, designated by the names of their principal seams. The Mary Lee group includes the Blue Creek, the Jagger and the Newcastle seams, most of which are mined in places. The Brookwood, the Pratt and the Mary Lee produce most of the coking coal mined in the State, and more than half of all of the coal mined in the district.

The Cahaba Basin, second in importance, is a long, narrow syncline, 68 miles long and about six miles wide, southeast of the Warrior, and occupies parts of St. Clair, Jefferson, Shelby and Bibb Counties. There are many workable beds, and the total quantity of coal in the basin is large. The production is something over 16 per cent of the total for the State.

The Coosa Basin is a deep syncline east of the Cahaba and parallel with it, extending across Shelby and St. Clair Counties. It is also long and narrow, about 60 miles long by six miles wide. It has not been thoroughly explored, but in different parts of the area from two to twelve beds, three or more feet in thickness, have been reported.

The Plateau Field embraces parts of Blount, Etowah, DeKalb, Cullman, Winston, Madison, Cherokee, Marshall and Jackson Counties, and, although it has an area underlain by coal four times that of the Cahaba and the Coosa combined, the resources in Alabama are comparatively small. There are four to six beds locally workable.

So far as reliable information is available, the earliest record of the existence of coal in Alabama was made in 1834. The first statement of production in the State is contained in the United States census report for 1840, in which year the production is given at 946 tons. The census report for 1850 does not mention any coal production for the State, and the next authentic record is contained in the census statistics of 1860, when Alabama is credited with an output of 10,200 short tons. The mines of Alabama were probably worked to a considerable extent during the Civil War, but there are no records of the actual production until 1870, for which year the United States census reports a production of 11,000 tons. Ten years later the production had increased to 323,972 short tons, but the development of the present great industry really began in 1881 and 1882, when attention was directed to the large iron deposits near the city of Birmingham and thus the great "boom" of that city and vicinity was inaugurated. By 1885 the coal production of the State had increased to nearly 2,500,000 tons. Then followed a period of relapse and liquidation, which lasted two years, after which business settled down to a conservative and rational basis and has since developed steadily. In 1902 the coal production of the State reached a total of more than 10,000,000 tons, and reached the maximum of 17,678,522 tons in 1913, since which time there has been a decrease, until 1916, when the maximum of 1913 was exceeded, as may be seen in the table below.

## PRODUCTION

The statistics of production in Alabama from 1840 to the close of 1925 are shown in the following table:

*Production of Coal in Alabama From 1840 to 1925, in Short Tons*

| Year | Quantity | Year | Quantity | Year | Quantity | Year | Quantity |
|---|---|---|---|---|---|---|---|
| 1840 | 946 | 1861 | 10,000 | 1882 | 893.000 | 1904 | 11,262,046 |
| 1841 | 1,000 | 1862 | 12,500 | 1883 | 1,568,000 | 1905 | 11,866,069 |
| 1842 | 1,000 | 1863 | 15,000 | 1884 | 2,240,000 | 1906 | 13,107,963 |
| 1843 | 1,200 | 1864 | 15,000 | 1885 | 2,492,000 | 1907 | 14,250,454 |
| 1844 | 1,200 | 1865 | 12,000 | 1886 | 1,800,000 | 1908 | 11.604,593 |
| 1845 | 1,500 | 1866 | 12,000 | 1887 | 1,950,000 | 1909 | 13,703,450 |
| 1846 | 1,500 | 1867 | 10,000 | 1888 | 2,900,000 | 1910 | 16,111,462 |
| 1847 | 2,000 | 1868 | 10,000 | 1889 | 3,572,983 | 1911 | 15,021,421 |
| 1848 | 2,000 | 1869 | 10,000 | 1890 | 4,090,409 | 1912 | 16,100,600 |
| 1849 | 2,500 | 1870 | 11,000 | 1891 | 4,759,781 | 1913 | 17,678,522 |
| 1850 | 2,500 | 1871 | 15,000 | 1892 | 5,529,312 | 1914 | 15,593,422 |
| 1851 | 3,000 | 1872 | 16,800 | 1893 | 5,136,935 | 1915 | 14,927,937 |
| 1852 | 3,000 | 1873 | 44,800 | 1894 | 4,397,178 | 1917 | 20,068,074 |
| 1853 | 4,000 | 1874 | 50,400 | 1895 | 5,693,775 | 1916 | 18,086,197 |
| 1854 | 4,500 | 1875 | 67,200 | 1896 | 5,748,697 | 1918 | 19,184,962 |
| 1855 | 6,000 | 1876 | 112,000 | 1897 | 5,893,770 | 1919 | 15,536,721 |
| 1856 | 6,800 | 1877 | 196,000 | 1898 | 6,535,283 | 1920 | 16,294,099 |
| 1857 | 8,000 | 1878 | 224,000 | 1899 | 7,593,416 | 1921 | 12,568,899 |
| 1858 | 8,500 | 1879 | 280,000 | 1900 | 8,etaoTN | 1922 | 18,324,740 |
| 1859 | 9,000 | 1880 | 323,972 | 1901 | 9,099,052 | 1923 | 20,457,649 |
| 1860 | 10,200 | 1881 | 420,000 | 1902 | 10,354,570 | 1924 | 19,130,184 |
|  |  |  |  | 1903 | 11,654,324 | 1925 | 20,004,395 |
| Total |  |  |  |  |  |  | 465,131,637 |

# REVIEW OF THE COAL INDUSTRY IN 1925

By F. G. Tryon and L. Mann

## BITUMINOUS COAL

*Continuance of 1924 depression.*—The depression in the bituminous coal industry which had been so acute in 1924 continued far into 1925, but was relieved after September 1 by the extra demand that accompanied the great strike of the anthracite miners. Save for this diversion, 1925, in the bituminous coal trade, was a year of declining prices, of narrow profits or absolute losses, of abandoned mines, and of unemployment.

The condition of the bituminous coal-mining industry was the more striking because, for most other business, 1925 was a year of abounding prosperity. Agriculture indeed was depressed, but agriculture has little influence on the demand for coal. Judged by other barometers of production and finance, 1925 set a new record for total volume of business done. In such a year why did not bituminous coal share in the general prosperity?

*Influence of war-time expansion.*—The answer to the above question is found in causes that were set in motion by the high prices of the war and the period immediately after—causes that began to be felt years later and whose full effect has not been sensed even yet. Chief among these was the growth of mine capacity. Even before the war there had always been a capacity to produce more than the market would absorb, as shown by the fact that the mines worked an average of only 215 days a year; but with the opening of thousands of new mines and the expansion of existing mines the over-development became more pronounced. From 1915 to 1923, 275,000,000 tons were added to capacity*, an amount so far in excess of the need that in 1923 the mines reported an average working time of only 179 days, although the year was one of active business with heavy purchases for storage.

*Influence of fuel economy.*—The fact of the increased capacity was familiar to every coal man who had watched the new mines opening in his own district. Less familiar, but no less important, was a gradual change in the demand. The high prices of 1917, 1918, 1920, and 1922 had turned the attention of consumers to economy in the use of fuel to a degree unknown before. The electric utilities cut their unit consumption of coal per kilowatt hour from 3.2 pounds in 1919 to 2.1 in 1925, a reduction of 34 per cent in 6 years. Manufacturers shut down their own small steam plants and bought electric power from the more efficient central stations. The railroads, the coke ovens, the iron and steel furnaces, and even the manufacturers who continued to make their own power, all bent their energies to getting more work out of the same ton of coal, and wherever records of fuel performance are kept the same story of diminishing consumption of fuel per unit of product is found.

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*This figure assumes a potential working time of 280 days—a conservative allowance—and if the entire potential working year of 308 days be assumed, the increase would be even more startling (Table 7). At either 308 or 280 days it is clear that the increase was unprecedented.

*Competition of other sources of power.*—Reinforcing the trend to fuel economy now came another factor—the competition of other sources of power. The consumption of all coal—anthracite and bituminous combined—increased only 3.3 per cent from 1913 to 1925, but the consumption of natural gas increased 104 per cent, of petroleum 211 per cent, and of water power 119 per cent. The rise of hydroelectric power was especially marked after the passage of the Federal water power act in 1920, which opened the navigable streams to development under a system of licensing, and the increase in the annual production of water power in 1925 over 1920 was equivalent to 13,000,000 tons of coal. The rise of oil competition was accelerated by the nearly simultaneous discovery about 1923 of five very large new pools, which threw a great surplus of oil upon the boiler-fuel market. Statistics compiled by the American Petroleum Institute show that the increase in annual consumption of fuel oil and of crude oil used as fuel between 1920 and 1925 was equivalent to 30,000,000 tons of coal. If allowance is made for the unseen competition of the refined products of petroleum, which are meeting demands for energy that would otherwise tend to fall upon coal, the displacement of coal appears far greater. The increase in the total quantity of petroleum consumed from 1920 to 1925 was equivalent to 70,000,000 tons of coal a year.

*Growth of demand arrested.*—The net result of the economies effected and the competition of petroleum and water power was to stop the normal growth of the demand for coal. Before the war the consumption of all coal, anthracite and bituminous, in the United

States was increasing at the rate of 18,000,000 tons a year. Had this rate of increase continued, the consumption of 1925 would have been 760,000,000 tons; actually it was only 563,000 tons.* Thus, the demand of 1925 fell something like 200,000,000 tons short of what all pre-war experience would have led the industry to expect. The former steady growth, to which the industry had become accustomed for over a century, had been checked and for the moment apparently stopped dead. This one factor goes far to explain the present depression of the bituminous coal industry.

*Readjustment inevitable.*—Had it not been for the arrested demand the inflation of mine capacity would have been less serious. There had been overdevelopment before, but the normal growth of demand always tended to absorb the excess. If the demand had continued to grow at the old rate, it might eventually have furnished business for the new mines and employment for the thousands of newly recruited miners. The expected increase, however, failed to materialize, and the factor of stationary demand was added to the factor of over-expanded capacity; readjustment then became inevitable. The bituminous industry could not continue indefinitely with an average working time of 179 days a year.

*Postponement by strikes and car shortage.*—For half a decade readjustment was postponed by a series of events that counteracted the effect of changed conditions of supply and demand. In 1919 a general strike shut off six weeks' production of the union bituminous mines. In 1920 there was an abnormal demand for export, the anthracite miners took a 20-day "vacation," and the railway switchmen's strike caused an acute shortage of cars at the mines. In 1921 the British miners struck for more than three months, and again an abnormal demand for export helped to fill the void at home. In 1922 both the union bituminous and the anthracite mines were closed for nearly five months in the greatest suspension in our history—a suspension in which many nonunion bituminous miners also joined. Moreover, in 1922 the railway shopmen's strike disorganized transportation for many months. In 1923 the French went into the Ruhr, again stimulating the export trade, and American consumers bought 26,000,000 tons of coal for storage, to build up the reserves they had exhausted in the strike of the preceding year and to prepare for the possibility of another strike. Thus, from 1919 to 1923, with comparatively brief interludes, some external force such as a strike or a car shortage was always intervening, covering up the silent changes which were going on in the relation of supply and demand and postponing their inevitable adjustment.

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*The figures given refer to consumption after deducting exports and allowing for changes in stocks. They include anthracite as well as bituminous coal because of the misleading effect which would otherwise be introduced by the anthracite strike of 1925. Some millions of tons of bituminous coal, either direct or in the form of coke, were used to replace the deficit in anthracite.

*Peace and adequate transportation assured.*—In 1924 this series of events ended. The signing of a long-time wage agreement at Jacksonville, Fla., to run from April 1, 1924, to March 31, 1927, removed the possibility of interruption by strike. At the same time transportation improved remarkably. By the purchase of additional cars and locomotives, by improvement of yards and terminals, and, what is more important, by greater efficiency in operation the railroads dispelled the old bogey, car shortage. In the past complaints over the car supply were heard whenever production reached 10,000,000 tons a week; now the railroads were prepared to handle 12,000,000 and 13,000,000 tons without difficulty. So marked was the improvement that when the test came during the anthracite strike of 1925 and soft coal was in heavy demand to replace anthracite the carriers handled a bituminous production of over 12,000,000 tons for nine successive weeks with practically no complaint of car shortage. Their achievement was the more remarkable because much of this coal was moved abnormally long distances into the anthracite-consuming territory.

*Market changes become apparent in 1924.*—With strikes and car shortage eliminated, the pressure of surplus capacity and changing demand now slumped down upon the industry with crushing weight. In 1924 the depression was aggravated by the necessity of liquidating the enormous stocks which consumers had accumulated in anticipation of a possible strike and which the Jacksonville agreement rendered unnecessary. By 1925 the liquidation had been largely completed, but the market was still very dull. Spot prices declined from January to July. The average value per ton dropped from $2.20 in 1924 to $2.04 in 1925 and mines continued to close.

*Severity of the depression.*—All these conditions reflected the difficult times through which the industry was passing. It had experienced hard times before, but never, so far as reflected in the statistical record, as hard as those of 1924 and 1925. The depression was most acute in the Northern States but was felt in the South also. For the first time in the 35 years covered by the statistical record there was an absolute reduction in mine capacity. In former depressions the growth of capacity had been checked. This time it dropped from 885,000,000 tons in 1923 to 748,000,000 in 1925.* The change not only involved shutting down thousands of wagon mines but 2,187 commercial mines. In consequence average sales prices were cut by 24 per cent and 116,000 men laid off.

*Shifts in business from North to South.*—The burden of the depression was heaviest in the union States, which operated under a fixed wage scale, whereas the southern fields were free to readjust wages and thereby obtain the business. For many months after the strike of 1922 wage rates in the nonunion fields were on a parity with the union rates. Reports of wage cuts, however, began late in 1923, and after the Jacksonville agreement was signed most of the nonunion operators reduced the rates first to the 1919 and later to the 1917 level, or even lower. Against a standard day wage of $7.50 in the union fields, the nonunion fields were paying nearer $5,* and there were corresponding differences in the tonnage rates. The result in terms of costs of production is seen in the fact that nonunion western Kentucky sold coal at an average sales realization of $1.44 f. o. b. mine, whereas in Indiana, its union competitor, the average sales realization was $2.02, this difference of 58 cents per ton being a rough measure of the competitive advantage of the lower wage scale in the nonunion field. A like difference, sometimes more and sometimes less, is found between the average prices of other union and nonunion States.

Responding to these differences in cost of production, business was diverted from the northern to the southern fields. Between 1923 and 1925 the production of Illinois decreased 16 per cent, that of Indiana decreased 19 per cent, and that of Ohio 31 per cent. The production of West Virginia, on the contrary, increased 13 per cent, and that of Kentucky increased 23 per cent. As late as 1921 Kentucky ranked below Ohio; in 1925 it produced nearly twice as much as Ohio. In 1923 Pennsylvania led West Virginia by 64,000,000 tons; in 1925 Pennsylvania was still ahead, but by less than 15,000,000 tons.

*Depression in the South.*—These shifts of business from North to South are familiar to every coal man and have been the subject of much comment. What is not so familiar is that in the South as well as in the North a difficult readjustment was going on. Intense competition was forcing the closing of high-cost mines and the liquidation of surplus capacity. The differences between North and South were differences of degree. West Virginia shut down 493 commercial mines between 1923 and 1925 and discharged a total of 7,111 men. In Kentucky 194 commercial mines had to close and 3,787 men lost their jobs. In both Kentucky and West Virginia, in spite of the increase in production, the aggregate capacity in operation decreased. In all but one of the 24 principal producing States the number of men employed in 1925 was less than in 1923. In Alabama the reduction in men employed was 9.8 per cent; in Tennessee, 26 per cent; in Maryland, 3.9 per cent; in Virginia, 3.1 per cent; in West Virginia, 6 per cent; and in Kentucky, 6.2 per cent. In the entire area east of the Mississippi and south of the Ohio and Potomac there were 17,000 less miners at work in 1925 than in 1923. The great increase in southern production was accomplished by working more days, not by hiring more men.

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*Assuming 280 days' operation.

*There is the widest variation in rates in the nonunion fields, and no accurate and comprehensive information exists as to the rates actually paid. It is known, however, that many nonunion mines were paying approximately $4 or $5 for inside day labor.

*Steadier working time.*—The mines that managed to keep open tended to run more steadily. The average time worked by the mines in operation in 1925 was 195 days, an increase of 16 days over 1923, in spite of the fact that the production of 1925 was smaller. In West Virginia the average time worked increased 56 days; in union Indiana, 23 days; and in Illinois, 3 days. Similarly, the annual output per worker at the mines which remained in operation increased. In Illinois it increased from 795 tons per man to 860 tons, or 8 per cent, from 1923 to 1925. In Kentucky it increased 31 per cent, and for the country as a whole 10 per cent. This evidence of steadier work for the men at the mines that continued in operation only emphasizes the plight of those at the other mines that could not operate at all.

*Concentration of work in the larger mines.*—With the closing of less efficient mines, which tended to continue in the nonunion as well as in the union States, a larger proportion of the output than ever before came from the big mines in 1925. In the United States, as a whole, 53.7 per cent of the production of 1925 was contributed by class 1 mines, against 47.2 per cent in 1923. (Class 1 mines are those producing 200,000 tons or more.) In West Virginia the tonnage of the class 1 mines increased from 74.9 to 82.4 per cent. Thus in both union and nonunion districts the changed conditions were tending to eliminate smaller mines and concentrate available business among the larger mines. This tendency was further accentuated by financial consolidations of operating companies, a considerable number of which occurred in 1924 and 1925.

*Effect of the anthracite strike.*—On September 1 the depression of the bituminous market was temporarily relieved by the general strike in the anthracite region. The shortage of domestic fuel in New England and the Middle Atlantic States created a demand for some millions of tons of substitutes. In the bituminous coal trade the chief beneficiaries were the "smokeless" coal fields in southern West Virginia and central Pennsylvania and those producers of high-volatile lump coal who were near enough to the anthracite region to participate in the demand. Thus the spot price of West Virginia smokeless run of mine per net ton f. o. b. mines, as quoted by Coal Age in the Boston market, jumped from $1.58 in July to $2.49 in September. A slight recession in October was followed by advances in November, and the December average was $2.29. Outside these few districts of the East, however, the anthracite strike was scarcely felt, and for the country as a whole Coal Age's average spot price for the last quarter of the year was only 12 cents a ton higher than in the same period of 1924.

*Summary of coal produced, value, men employed, days worked, and output per man per day, by States, in 1924*

(Note that figures relate only to active mines of commercial size; no canvass of wagon mines was made)

| State | Net tons | | | | | Value | | Number of employees | | | | Average number of days worked | Average tons per man per day |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Underground | | | | | |
| | Loaded at mines for shipment | Sold to local trade and used by employees | Used at mines for steam and heat | Made into coke at mines | Total quantity | Total | Average per ton | Miners, loaders, and shot firers | All others | Surface | Total | | |
| Alabama | 18,395,094 | 348,580 | 215,450 | 171,060 | 19,130,184 | 44,756,000 | $2.34 | 15,892 | 7,216 | 4,848 | 27,956 | 220 | 3.11 |
| Alaska | 93.938 | 4,321 | 1,410 | ---- | 99,663 | 560,000 | 5.62 | 60 | 40 | 67 | 167 | 287 | 2.08 |
| Arkansas | 1,402,929 | 15,019 | 33,555 | ---- | 1,451,503 | 5,898,000 | 4.06 | 1,811 | 732 | 807 | 3,350 | 134 | 3.24 |
| California, Idaho, Nebraska, Oregon | 8,352 | 7,851 | 750 | ---- | 16,953 | 71,000 | 4.19 | 36 | 20 | 27 | 83 | 156 | 1.31 |
| Colorado | 9,512,534 | 561,539 | 236,696 | 133,329 | 10,444,098 | 31,863,000 | 3.05 | 8,023 | 2,978 | 1,953 | 12,954 | 178 | *4.52 |
| Georgia | 58,097 | 611 | 1,839 | 14,400 | 74,947 | 271,000 | 3.62 | 55 | 19 | 69 | 143 | 248 | 2.11 |
| Illinois | 63,689,920 | 3,319,700 | 1,313,661 | ---- | 68,323,281 | 155,260,000 | 2.27 | 59,451 | 21,306 | 8,606 | 89,363 | 148 | 5.16 |
| Indiana | 20,338,416 | 725,561 | 416,236 | ---- | 21,480,213 | 46,453,000 | 2.16 | 17,717 | 6,210 | 3,631 | 27,558 | 136 | 5.75 |
| Iowa | 4,351,252 | 993,393 | 123,805 | ---- | 5,468,450 | 18,097,000 | 3.31 | 8,382 | 2,677 | 1,042 | 12,101 | 161 | 2.80 |
| Kansas | 3,871,125 | 309,806 | 66,802 | ---- | 4,247,733 | 12,854,000 | 3.03 | 6,182 | 1,250 | 1,129 | 8,561 | 151 | 3.29 |
| Kentucky | 43,683,182 | 859,023 | 458,205 | 146,794 | 45,147,204 | 84,733,000 | 1.88 | 31,864 | 14,703 | 9,199 | 55,766 | 174 | 4.67 |
| Maryland | 1,945,259 | 171,925 | 16,519 | ---- | 2,133,703 | 4,629,000 | 2.17 | 2,373 | 856 | 547 | 3,776 | 173 | 3.27 |
| Michigan | 767,359 | 6,433 | 57,228 | ---- | 831,020 | 3,602,000 | 4.33 | 1,016 | 390 | 145 | 1,551 | 178 | 3.00 |
| Missouri | 2,169,155 | 244,302 | 67,423 | ---- | 2,480,880 | 8,154,000 | 3.29 | 3,649 | 1,068 | 1,260 | 5,977 | 135 | 2.08 |
| Montana | 2,650,836 | 170,590 | 83,939 | ---- | 2,905,365 | 8,596,000 | 2.96 | 1,852 | 823 | 521 | 3,196 | 173 | 5.26 |
| New Mexico | 2,549,438 | 49,001 | 51,412 | 136,212 | 2,786,063 | 9,774,000 | 3.51 | 2,416 | 851 | 939 | 4,206 | 204 | 3.25 |
| North Carolina | 51,094 | 1,200 | 4,800 | ---- | 57,094 | 224,000 | 3.92 | 60 | 33 | 27 | 120 | 287 | 1.66 |
| North Dakota | 957,987 | 212,994 | 29,546 | ---- | 1,200,527 | 2,473,000 | 2.06 | 671 | 186 | 441 | 1,298 | 165 | 5.62 |
| Ohio | 27,404,951 | 2,685,565 | 382,491 | ---- | 30,473,007 | 62,011,000 | 2.03 | 29,481 | 8,966 | 5,782 | 44,229 | 143 | 4.82 |
| Oklahoma | 2,236,937 | 35,999 | 56,679 | | 2,329,615 | 8,500,000 | 3.69 | 3,324 | 1,740 | 1,080 | 6,144 | 124 | 3.05 |
| Pennsylvania, bituminous | 110,240,821 | 6,565,736 | 1,835,366 | 11,991,850 | 130,633,773 | 295,164,000 | 2.26 | 108,773 | 38,312 | 22,237 | 69,322 | 180 | 4.27 |
| South Dakota | 3,000 | 9,043 | ---- | ---- | 12,043 | 36,000 | 2.99 | 40 | ---- | ---- | 40 | 138 | 2.18 |
| Tennessee | 4,142,873 | 73,700 | 109,781 | 230,201 | 4,556,555 | 9,711,000 | 2.13 | 5,726 | 2,236 | 1,403 | 9,365 | 159 | 3.05 |
| Texas | 1,119,048 | 7,256 | 20,707 | ---- | 1,147,011 | 1,721,000 | 1.50 | 1,426 | 456 | 313 | 2,195 | 166 | 3.16 |
| Utah | 4,107,261 | 51,400 | 60,566 | 268,930 | 4,488,157 | 12,057,000 | 2.69 | 2,369 | 1,023 | 938 | 4,330 | 182 | *5.70 |
| Virginia | 9,756,162 | 168,530 | 51,951 | 716,821 | 10,693,464 | 21,823,000 | 2.04 | 6,131 | 4,255 | 2,293 | 12,679 | 226 | 3.73 |
| Washington | 2,442,059 | 92,366 | 69,903 | 49,339 | 2,653,667 | 9,689,000 | 3.65 | 2,192 | 982 | 684 | 3,858 | 202 | 3.41 |
| West Virginia | 97,169,314 | 3,307,505 | 652,855 | 533,223 | 101,662,897 | 185,299,000 | 1.82 | 55,067 | 30,480 | 16,656 | 02,203 | 182 | 5.48 |
| Wyoming | 6,447,307 | 112,055 | 198,106 | | 6,757,468 | 18,327,000 | 2.71 | 4,285 | 1,772 | 1,056 | 7,113 | 176 | 5.41 |
| Total bituminous | 441,565,694 | 21,111,004 | 6,617,681 | 14,392,159 | 483,686,538 | 1,062,626,000 | 2.20 | 380,324 | 151,580 | 87,700 | 19,604 | 171 | 4.56 |
| Pennsylvania anthracite | 77,247,499 | 3,043,939 | 7,635,424 | | 87,926,862 | 477,231,000 | 5.43 | 76,035 | 43,328 | 40,646 | 0,009 | 274 | 2.00 |
| Grand total | 518,813,193 | 24,154,943 | 14,253,105 | 14,392,159 | 571,613,400 | 1,539,857,000 | 2.69 | 456,359 | 194,908 | 128,346 | 79,613 | 192 | 3.81 |

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*Probably too high because of practice common in some districts of men going into mines to shoot coal and load mine cars on days when tipples or mines, as a whole, are not in operation.

## *Summary of coal produced, value, men employed, days worked, and output per man per day, by States, in 1925*

(Note that figures relate only to active mines of commercial size; no canvass of wagon mines was made)

| State | Net tons | | | | | Value | | Number of employees | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Underground | | | | | | |
| | Loaded at mines for shipment | Sold to local trade and used by employees | Used at mines for steam and heat | Made into coke at mines | Total quantity | Total | Average per ton | Miners, loaders, and shot firers | Haulage and track | All others | Surface | Total | Average number of days worked | Average tons per man per day |
| Alabama | 19,056,901 | 550,491 | 298,833 | 98,167 | 20,004,39 | $42,112,000 | $2.11 | 15,596 | 3,251 | 3,792 | 4,458 | 27,097 | 246 | 3.00 |
| Alaska | 77,830 | 3,975 | 1,063 | ---- | 82,868 | 405,000 | 4.89 | 55 | 10 | 26 | 66 | 157 | 243 | 2.17 |
| Arkansas | 1,176,888 | 20,460 | 22,691 | ---- | 1,220,039 | 4,829,000 | 3.96 | 2,088 | 373 | 388 | 789 | 3,638 | 112 | 2.99 |
| California, Idaho, and Oregon | 4,900 | 7,725 | ---- | ---- | 12,625 | 60,000 | 4.75 | 21 | 3 | 5 | 13 | 42 | 174 | 1.73 |
| Colorado | 9,454,769 | 528,098 | 218,303 | 109,381 | 10,310,551 | 30,322,000 | 2.94 | 8,472 | 1,453 | 1,269 | 2,009 | 13,203 | 192 | *4.07 |
| Georgia | 55,532 | 579 | 1,412 | 8,651 | 66,174 | 220,000 | 3.32 | 37 | 11 | 19 | 70 | 137 | 220 | 2.20 |
| Illinois | 62,712,422 | 3,170,520 | 1,026,417 | ---- | 66,909,359 | 146,492,000 | 2.19 | 53,242 | 8,534 | 8,568 | 7,479 | 77,823 | 161 | 5.33 |
| Indiana | 20,253,156 | 558,317 | 413,493 | ---- | 21,224,966 | 42,884,000 | 2.02 | 14,412 | 2,928 | 2,031 | 3,361 | 22,732 | 159 | 5.89 |
| Iowa | 3,711,654 | 905,840 | 97,349 | ---- | 4,714,843 | 14,807,000 | 3.14 | 7,302 | 933 | 1,102 | 830 | 10,167 | 153 | 3.02 |
| Kansas | 4,181,723 | 282,242 | 60,286 | ---- | 4,524,251 | 13,013,000 | 2.88 | 5,462 | 558 | 592 | 1,188 | 7,800 | 169 | 3.44 |
| Kentucky | 53,721,081 | 793,337 | 428,063 | 126,189 | 55,068,670 | 94,825,000 | 1.72 | 33,216 | 7,361 | 7,462 | 8,985 | 57,024 | 206 | 4.68 |
| Maryland | 2,565,868 | 111,287 | 17,417 | ---- | 2,694,572 | 5,312,000 | 1.97 | 2,406 | 455 | 266 | 453 | 3,580 | 209 | 3.61 |
| Michigan | 741,449 | 15,310 | 51,474 | ---- | 808,233 | 3,391,000 | 4.20 | 1,028 | 280 | 132 | 139 | 1,579 | 186 | 2.75 |
| Missouri | 2,384,642 | 261,099 | 48,474 | ---- | 2,694,215 | 8,281,000 | 3.07 | 2,994 | 300 | 607 | 1,213 | 5,114 | 166 | 3.18 |
| Montana | 2,858,174 | 131,570 | 53,942 | ---- | 3,043,686 | 7,879,000 | 2.59 | 1,576 | 293 | 360 | 451 | 2,680 | 171 | 6.64 |
| New Mexico | 2,338,094 | 45,389 | 51,635 | 121,733 | 2,556,851 | 8,611,000 | 3.37 | 2,248 | 416 | 322 | 458 | 3,444 | 202 | 3.68 |
| North Carolina | 58,160 | 524 | 6,469 | ---- | 65,153 | 283,000 | 4.34 | 65 | 28 | 19 | 28 | 140 | 272 | 1.71 |
| North Dakota | 1,035,923 | 258,183 | 30,514 | ---- | 1,324,620 | 2,445,000 | 1.85 | 718 | 74 | 76 | 439 | 1,307 | 153 | 6.61 |
| Ohio | 24,930,193 | 2,741,751 | 362,168 | ---- | 28,034,112 | 54,057,000 | 1.93 | 27,544 | 3,347 | 3,935 | 4,832 | 39,658 | 151 | 4.67 |
| Oklahoma | 2,232,901 | 23,353 | 69,586 | ---- | 2,325,840 | 7,667,000 | 3.30 | 3,078 | 853 | 677 | 1,023 | 5,631 | 153 | 2.70 |
| Pennsylvania, bituminous | 114,456,238 | 7,584,846 | 1,517,142 | 13,369,793 | 136,928,019 | 287,899,000 | 2.10 | 103,698 | 14,697 | 19,067 | 19,336 | 156,798 | 200 | 4.36 |
| South Dakota | 5,180 | 9,267 | ---- | ---- | 14,447 | 42,000 | 2.91 | 49 | ---- | ---- | ---- | 49 | 143 | 2.06 |
| Tennessee | 5,040,944 | 113,934 | 98,170 | 200,963 | 5,454,011 | 10,077,000 | 1.85 | 5,171 | 1,059 | 825 | 1,259 | 8,314 | 211 | 3.11 |
| Texas | 982,129 | 7,910 | 18,336 | ---- | 1,008,375 | 1,566,000 | 1.55 | 1,406 | 194 | 193 | 315 | 2,108 | 150 | 3.19 |
| Utah | 4,349,925 | 42,235 | 50,709 | 247,473 | 4,690,342 | 11,991,000 | 2.56 | 2,570 | 585 | 451 | 835 | 4,441 | 179 | *5.90 |
| Virginia | 12,032,321 | 113,573 | 39,929 | 613,620 | 12,799,443 | 23,496,000 | 1.84 | 6,686 | 2,135 | 2,442 | 2,414 | 13,677 | 254 | 3.69 |
| Washington | 2,316,191 | 114,623 | 56,593 | 50,483 | 2,537,890 | 9,176,000 | 3.62 | 2,059 | 379 | 537 | 751 | 3,726 | 193 | 3.52 |
| West Virginia | 118,191,674 | 2,839,028 | 544,107 | 806,150 | 122,380,959 | 209,655,000 | 1.71 | 60,323 | 17,240 | 14,795 | 17,831 | 110,189 | 225 | 4.94 |
| Wyoming | 6,245,947 | 115,757 | 191,528 | | 6,553,232 | 18,275,000 | 2.79 | 3,934 | 776 | 601 | 927 | 6,238 | 178 | 5.90 |
| Total bituminous | 477,172,812 | 21,351,223 | 5,776,103 | 15,752,603 | 520,052,741 | 1,060,402,000 | 2.04 | 367,456 | 68,526 | 70,559 | 81,952 | 588,493 | 195 | 4.52 |
| Pennsylvania anthracite | 53,768,372 | 2,884,577 | 5,164,200 | | 61,817,149 | 327,665,000 | 5.30 | 78,773 | 17,000 | 24,795 | 39,744 | 160,312 | 182 | 2.12 |
| Grand total | 530,941,184 | 24,235,800 | 10,940,303 | 15,752,603 | 581,869,890 | 1,388,067,000 | 2.38 | 446,229 | 85,526 | 95,354 | 121,696 | 748,805 | 192 | 4.04 |

*Probably too high because of the practice, common in some districts, of men going into mines to shoot coal and load mine cars on days when the tipples or mines, as a whole, are not in operation.

## PRODUCTION SUMMARIES, BY STATES

*Comparison of bituminous coal produced, by States, in 1913, 1923-1925*

| State | Production (net tons) | | | | Per cent of increase or decrease | | |
|---|---|---|---|---|---|---|---|
| | 1913 | 1923 | 1924 | 1925 | 1924 to 1925 | 1923 to 1925 | 1913 to 1925 |
| Alabama | 17,678,522 | 20,457,649 | 19,130,184 | 20,004,395 | +4.6 | —2.2 | +13.2 |
| Arkansas | 2,234,107 | 1,296,892 | 1,451,503 | 1,220,039 | —15.9 | —5.9 | —45.4 |
| Colorado | 9,232,510 | 10,346,218 | 10,444,098 | 10,310,551 | —1.3 | —.3 | +11.7 |
| Georgia | 255,626 | 75,620 | 74,947 | 66,174 | —11.7 | —12.5 | —74.1 |
| Illinois | 61,618,744 | 79,310,075 | 68,323,281 | 66,909,359 | —2.1 | —15.6 | +8.6 |
| Indiana | 17,165,671 | 26,229,099 | 21,480,213 | 21,224,966 | —1.2 | —19.1 | +23.6 |
| Iowa | 7,525,936 | 5,710,735 | 5,468,450 | 4,714,843 | +6.5 | +1.8 | —37.2 |
| Kansas | 7,202,210 | 4,443,149 | 4,247,733 | 4,524,251 | +22.0 | +23.0 | +180.7 |
| Kentucky | 19,616,600 | 44,777,317 | 45,147,204 | 55,068,670 | —13.8 | —17.4 | —37.4 |
| Maryland | 4,779,839 | 2,285,926 | 2,133,703 | 2,694,572 | +21.8 | +17.9 | —43.6 |
| Michigan | 1,231,786 | 1,172,075 | 831,020 | 808,233 | —2.7 | —31.0 | —34.4 |
| Missouri | 4,318,125 | 3,403,151 | 2,480,880 | 2,694,215 | +8.6 | —20.8 | —37.6 |
| Montana | 3,240,973 | 3,147,678 | 2,905,365 | 3,043,686 | +4.8 | —3.3 | —6.1 |
| New Mexico | 3,708,806 | 2,915,173 | 2,786,063 | 2,556,851 | —8.2 | —12.3 | —31.1 |
| North Dakota | 495,320 | 1,385,400 | 1,200,527 | 1,324,620 | +10.3 | —4.4 | +167.4 |
| Ohio | 36,200,527 | 40,546,443 | 30,473,007 | 28,034,112 | —8.0 | —30.9 | —22.6 |
| Oklahoma | 4,165,770 | 2,885,038 | 2,329,615 | 2,325,840 | —.2 | —19.4 | —44.2 |
| Pennsylvania | 173,781,217 | 171,879,913 | 130,633,773 | 136,928,019 | +4.8 | —20.3 | —21.2 |
| South Dakota | 10,450 | 10,379 | 12,043 | 14,447 | +20.0 | +39.2 | +37.1 |
| Tennessee | 6,860,184 | 6,040,268 | 4,556,555 | 5,454,011 | +19.7 | —9.7 | —20.5 |
| Texas | 2,429,144 | 1,187,329 | 1,147,011 | 1,008,375 | —12.1 | —15.1 | —58.5 |
| Utah | 3,254,828 | 4,720,217 | 4,488,157 | 4,690,342 | +4.5 | —.6 | +44.1 |
| Virginia | 8,828,068 | 11,761,643 | 10,693,464 | 12,799,443 | +19.7 | +8.8 | +45.0 |
| Washington | 3,877,891 | 2,926,392 | 2,653,667 | 2,537,890 | —4.4 | —13.3 | —34.6 |
| West Virginia | 71,254,136 | 107,899,941 | 101,662,897 | 122,380,959 | +20.4 | +13.4 | +71.8 |
| Wyoming | 7,393,066 | 7,575,031 | 6,757,468 | 6,553,232 | —3.0 | —13.5 | —11.4 |
| Other States | 75,151 | 175,911 | 173,710 | 160,646 | —7.5 | —8.7 | +113.8 |
| | 478,435,297 | 564,564,662 | 483,686,538 | 520,052,741 | +7.5 | —7.9 | +8.7 |

*Coal produced in 1925, by States, and highest recorded production*

| State | 1925 (net tons) | Maximum production | |
|---|---|---|---|
| | | Year | Net tons |
| Alabama | 20,004,395 | 1923 | 20,457,649 |
| Alaska | 82,868 | 1923 | 119,826 |
| Arkansas | 1,220,039 | 1907 | 2,670,438 |
| California, Idaho, and Oregon | 12,625 | 1880 | 280,155 |
| Colorado | 10,310,551 | 1917 | 12,483,336 |
| Georgia | 66,174 | 1903 | 416,951 |
| Illinois | 66,909,359 | 1918 | 89,291,105 |
| Indiana | 21,224,966 | 1918 | 30,678,634 |
| Iowa | 4,714,843 | 1917 | 8,965,830 |
| Kansas | 4,524,251 | 1918 | 7,561,947 |
| Kentucky | 55,068,670 | 1925 | 55,068,670 |
| Maryland | 2,694,572 | 1907 | 5,532,628 |
| Michigan | 808,233 | 1907 | 2,035,858 |
| Missouri | 2,694,215 | 1917 | 5,670,549 |
| Montana | 3,043,686 | 1918 | 4,532,505 |
| New Mexico | 2,556,851 | 1918 | 4,023,239 |
| North Carolina | 65,153 | 1922 | 78,570 |
| North Dakota | 1,324,620 | 1923 | 1,385,400 |
| Ohio | 28,034,112 | 1920 | 45,878,191 |
| Oklahoma | 2,325,840 | 1920 | 4,849,288 |
| Pennsylvania,bituminous | 136,928,019 | 1918 | 178,550,741 |
| South Dakota | 14,447 | 1925 | 14,447 |
| Tennessee | 5,454,011 | 1910 | 7,121,380 |
| Texas | 1,008,375 | 1913 | 2,429,144 |
| Utah | 4,690,342 | 1920 | 6,005,199 |
| Virginia | 12,799,443 | 1925 | 12,799,443 |
| Washington | 2,537,890 | 1918 | 4,082,212 |
| West Virginia | 122,380,959 | 1925 | 122,380,959 |
| Wyoming | 6,553,232 | 1920 | 9,630,271 |
| Pennsylvania anthracite | 61,817,149 | 1917 | 99,611,811 |

## PRODUCTION, BY FIELDS

Many requests are received for information on production by trade fields as distinct from States and counties. In the next table the operators' reports to the Bureau of Mines have been retabulated according to the 92 fields into which the United States Coal Commission divided the bituminous coal mines. Corresponding figures for 1920 and 1921 will be found in Mineral Resources, 1923, Part II, pages 534-535, and for 1922 in Mineral Resources, 1924, Part II, pages 471-472.

The commission's grouping of the fields was made under the direction of C. E. Lesher and R. A. Walter, primarily with a view to its studies of cost of production. The fields are accurately delimited by metes and bounds on pages 2034-2052 of its report. Because all the fields adopted did not coincide with generally accepted trade districts they were designated by number rather than by name. For the convenience of the reader, however, the trade name most nearly corresponding to the boundaries established by the commission is also listed.

*Bituminous coal produced and number of mines active in the several fields adopted by the United States Coal Commission, 1923 and 1925*

(The definitions of these fields are given in detail on pp. 2034-2052, Part IV, of the report of the U. S. Coal Commission)

| Coal Commission field number | State | General name of field | 1923 Number of mines | 1923 (net tons) Production | 1925 Number of mines | 1925 Production (net tons) |
|---|---|---|---|---|---|---|
| 1 | Pennsylvania | Pittsburgh | 452 | 42,209,000 | 274 | 25,121,000 |
| 2 | do | Connellsville | 312 | 37,882,000 | 211 | 35,010,000 |
| 3 | do | Westmoreland-Ligonier | 171 | 14,563,000 | 115 | 13,939,000 |
| 4a, b | do | Freeport (thick and thin) | 123 | 12,338,000 | 89 | 8,089,000 |
| 5 | do | Butler-Mercer | 110 | 2,587,000 | 76 | 2,640,000 |
| 6 | do | Blossburg | 20 | 496,000 | 15 | 234,000 |
| 7 | do | Broad Top | 63 | 1,430,000 | 55 | 1,284,000 |
| 8 | do | Somerset | 332 | 5,772,000 | 167 | 6,730,000 |
| 9a | do | Central Pennsylvania, western | 1,385 | 54,364,000 | 109 | 2,908,000 |
| 9b | do | Central-Pennsylvania, middle | | | 178 | 8,866,000 |
| 9c | do | Central Pennsylvania, eastern | | | 685 | 32,107,000 |
| 10 | Maryland-West Virginia. | Maryland-Potomac | 159 | 3,890,000 | 125 | 4,305,000 |
| 11 | West Virginia | Fairmont | 309 | 22,883,000 | 192 | 19,433,000 |
| 12 | Ohio-West Virginia. | Panhandle-Pittsburgh No. 8 | 233 | 25,529,000 | 186 | 21,697,000 |
| 13 | do | Pomeroy | 41 | 1,309,000 | 27 | 714,000 |
| 14 | West Virginia | Putnam County | 10 | 345,000 | 3 | 237,000 |
| 15 | Kentucky-West Virginia | Kenova | 38 | 2,103,000 | 23 | 2,908,000 |
| 16 | do | Thacker | 89 | 6,149,000 | 67 | 7,965,000 |
| 17 | West Virginia | Thug River | 87 | 4,555,000 | 68 | 6,384,000 |
| 18 | Virginia-West Virginia | Pocahontas | 107 | 16,481,000 | 96 | 19,904,000 |
| 19 | West Virginia | Winding Gulf | 78 | 7,228,000 | 71 | 9,316,000 |
| 20 | do | New River | 145 | 8,810,000 | 117 | 10,907,000 |
| 21 | do | Kanawha | 285 | 12,741,000 | 171 | 14,499,000 |
| 22 | do | Coal River | 29 | 1,397,000 | 24 | 2,036,000 |
| 23 | do | Logan | 155 | 12,831,000 | 113 | 19,255,000 |
| 24a | do | Coal and Coke | 39 | 1,158,000 | 22 | 1,112,000 |
| 24b | do | Preston County | 58 | 1,937,000 | 38 | 1,779,000 |
| 24c | do | Taylor County, Junior, Philippi, and Gauley. | 176 | 6,140,000 | 119 | 5,347,000 |
| 25 | Virginia | Southwestern Virginia | 123 | 8,148,000 | 75 | 8,618,000 |
| 26 | do | Clinch Valley | 34 | 2,464,000 | 27 | 2,417,000 |
| 27 | do | Upper New River | *8 | *217,000 | 7 | 267,000 |
| 28 | do | Richmond Basin | * | * | | ------ |
| 29 | Ohio | Massillon-Palmyra-Lisbon | 90 | 2,815,000 | 82 | 1,695,000 |
| 30 | do | Coshocton-Goshen | 155 | 3,174,000 | 128 | 2,209,000 |
| 31 | do | Cambridge | 55 | 4,780,000 | 38 | 1,644,000 |
| 32 | do | Crooksville | 60 | 1,015,000 | 42 | 747,000 |
| 33 | do | Hocking | 241 | 7,517,000 | 142 | 4,875,000 |
| 34 | Ohio | Jackson and Ironton | 89 | 610,000 | 45 | 395,000 |
| 36 | Kentucky | Northeast Kentucky | 225 | 9,602,000 | 166 | 14,061,000 |
| 37 | do | Hazard | 128 | 6,660,000 | 93 | 7,625,000 |
| 38 | do | Harlan | 75 | 8,752,000 | 71 | 11,440,000 |
| 39 | Kentucky-Tennessee. | Southern Appalachian | 221 | 6,765,000 | 140 | 6,573,000 |
| 40 | do | Jellico | 55 | 1,003,000 | 32 | 1,009,000 |
| 41 | Kentucky | Western Kentucky | 172 | 10,890,000 | 161 | 12,187,000 |
| 42 | Tennessee | Rockwood-Soddy | 89 | 2,563,000 | 47 | 2,122,000 |
| 43 | do | Fentress | 13 | 541,000 | 7 | 751,000 |
| 44 | Alabama | Big Seam Group | 45 | 5,954,000 | 46 | 6,022,000 |
| 45 | Alabama-Georgia | Cahaba Group | 109 | 5,846,000 | 102 | 5,800,000 |
| 46 | Alabama | Pratt Group | 1 37 | 8,696,000 | 92 | 8,248,000 |
| 47 | Indiana | Indiana | 272 | 25,793,000 | 187 | 21,068,000 |
| 48 | do | Brazil Block | 29 | 345,000 | 16 | 157,000 |

*Upper New River field includes Richmond Basin field (No. 28).

*Bituminous coal produced and number of mines active in the several fields adopted by the United States Coal Commission, 1923 and 1925*
(Continued)

| Coal Commission field number | State | General name of field | 1923 Number of mines | 1923 Production (net tons) | 1925 Number of mines | 1925 Production (net tons) |
|---|---|---|---|---|---|---|
| 49 | Illinois | Northern Illinois | 60 | 2,334,000 | 45 | 1,753,000 |
| 50 | do | Fulton-Peoria | 119 | 4,190,000 | 120 | 3,510,000 |
| 51 | do | Danville | 32 | 4,178,000 | 29 | 3,424,000 |
| 52 | do | Central Illinois | 108 | 25,205,000 | 86 | 21,077,000 |
| 53 | do | Belleville | 106 | 10,193,000 | 78 | 6,153,000 |
| 54 | do | Murphysboro | 10 | 557,000 | 7 | 609,000 |
| 55 | do | Southern Illinois | 140 | 32,595,000 | 101 | 30,383,000 |
| 56 | Michigan | Michigan | 13 | 1,172,000 | 10 | 808,000 |
| 57 | Arkansas | Sebastian | 54 | 899,000 | 51 | 726,000 |
| 58 | do | Excelsior-Logan | 22 | 112,000 | 27 | 262,000 |
| 59 | do | Arkansas (anthracite) | 18 | 222,000 | 18 | 232,000 |
| 60 | Colorado | Colorado domestic | 145 | 4,430,000 | 143 | 4,681,000 |
| 61 | do | Trinidad | 44 | 3,182,000 | 42 | 2,986,000 |
| 62 | do | Northern Colorado | 47 | 2,715,000 | 44 | 2,644,000 |
| 63 | Iowa | Marion-Monroe-Polk | 89 | 4,485,000 | 134 | 3,762,000 |
| 64 | do | Appanoose | 62 | 1,217,000 | 73 | 953,000 |
| 65 | Kansas | Pittsburg | 192 | 4,135,000 | 202 | 4,297,000 |
| 66 | do | Lightning Creek | | | | |
| 67 | do | Osage | 27 | 115,000 | 27 | 165,000 |
| 68 | do | Leavenworth** | 4 | 137,000 | 3 | 94,000 |
| 69 | Missouri | Southern Missouri | †79 | †2,114,000 | 76 | 1,714,000 |
| 70 | do | Lafayette | 69 | 1,141,000 | 76 | 948,000 |
| 71 | do | Grundy | † | † | ** | ** |
| 72 | do | Platte | ** | ** | ** | ** |
| 73 | Montana | Montana | 48 | 3,144,000 | 52 | 3,044,000 |
| 74 | New Mexico | Gallup | 13 | 939,000 | †§15 | †§972,000 |
| 75 | do | Anthracite | 11 | 248,000 | 12 | 243,000 |
| 76 | do | Raton | 15 | 1,678,000 | 11 | 1,342,000 |
| 76a | do | Monero | 3 | 33,000 | †§ | †§ |
| 77 | North Dakota | Southern North Dakota | 72 | 910,000 | 93 | 832,000 |
| 78 | do | Northern North Dakota | 50 | 447,000 | 59 | 493,000 |
| 79 | Oklahoma | McAlester Vein | 25 | 640,000 | 21 | 360,000 |
| 80 | do | Oklahoma, Eastern | 90 | 2,200,000 | 79 | 1,966,000 |
| 81 | Texas | Texas (bituminous) | 10 | 175,000 | 7 | 182,000 |
| 82 | do | Texas (lignite) | 34 | 1,012,000 | 30 | 826,000 |
| 83 | Utah | Utah | 37 | 4,720,000 | 41 | 4,690,000 |
| 84 | Washington | Kittitas County | 12 | 1,358,000 | 10 | 871,000 |
| 85 | do | Pierce-King (bituminous) | 16 | 605,000 | 23 | 1,238,000 |
| 86 | do | Lewis | 28 | 963,000 | 23 | 429,000 |
| 87 | Wyoming | Wyoming | 62 | 7,559,000 | 61 | 6,553,000 |
| 88 | South Dakota | South Dakota | 15 | 10,000 | 17 | 14,000 |
| 89 | Oregon | Oregon | § | § | § | § |
| 90 | California§ | California§ | 5 | 20,000 | 5 | 13,000 |
| 91 | Nevada | Nevada | ---------- | ---------- | ---------- | ---------- |
| 92 | North Carolina | North Carolina | 2 | 36,000 | 2 | 65,000 |
| | Unclassified | | 12 | 120,000 | 9 | 83,000 |
| | | | 9,331 | 563,422,000 | 7,144 | 520,053,000 |

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**Leavenworth field, Kansas, includes Platte field, Missouri (No. 72), in 1923, and Grundy and Platte fields, Missouri (Nos. 71 and 72), in 1925.

†Southern Missouri field includes Grundy field (No. 71) in 1923.

†§Gallup field includes Monero field (No. 76a) in 1925.

§California includes Idaho and Oregon.

*Estimated monthly production of bituminous coal, by States, in 1925, in net tons*

| State | January | February | March | April | May | June | July |
|---|---|---|---|---|---|---|---|
| Alabama | 1,906,000. | 1,512,000 | 1,435,000 | 1,364,000 | 1,406,000 | 1,436,000 | 1,553,000 |
| Arkansas | 149,000 | 93,000 | 73,000 | 63,000 | 68,000 | 70,000 | 92,000 |
| Colorado | 1,220,000 | 830,000 | 622,000 | 565,000 | 605,000 | 600,000 | 603,000 |
| Illinois | 8,340,000 | 5,157,000 | 4,949,000 | 3,755,000 | 3,966,000 | 3,908,000 | 4,431,000 |
| Indiana | 2,638,000 | 1,633,000 | 1,697,000 | 1,384,000 | 1,349,000 | 1,355,000 | 1,440,000 |
| Iowa | 612,000 | 392,000 | 362,000 | 278,000 | 293,000 | 292,000 | 303,000 |
| Kansas | 537,000 | 365,000 | 309,000 | 178,000 | 278,000 | 270,000 | 315,000 |
| Kentucky: | | | | | | | |
| Eastern | 3,625,000 | 2,902,000 | 2,677,000 | 2,833,000 | 3,345,000 | 3,501,000 | 3,710,000 |
| Western | 1,144,000 | 753,000 | 754,000 | 669,000 | 663,000 | 768,000 | 862,000 |
| Maryland | 251,000 | 203,000 | 185,000 | 162,000 | 167,000 | 179,000 | 224,000 |
| Michigan | 96,000 | 74,000 | 63,000 | 48,000 | 34,000 | 32,000 | 48,000 |
| Missouri | 321,000 | 207,000 | 182,000 | 162,000 | 160,000 | 162,000 | 187,000 |
| Montana | 376,000 | 215,000 | 214,000 | 153,000 | 156,000 | 158,000 | 176,000 |
| New Mexico | 296,000 | 206,000 | 190,000 | 169,000 | 184,000 | 183,000 | 173,000 |
| North Dakota | 157,000 | 105,000 | 104,000 | 70,000 | 65,000 | 69,000 | 68,000 |
| Ohio | 2,819,000 | 2,180,000 | 2,143,000 | 1,840,000 | 1,903,000 | 1,889,000 | 1,989,000 |
| Oklahoma | 303,000 | 175,000 | 157,000 | 139,000 | 144,000 | 147,000 | 171,000 |
| Pennsylvania | 13,336,000 | 11,294,000 | 10,963,000 | 9,514,000 | 9,280,000 | 9,748,000 | 9,995,000 |
| Tennessee | 497,000 | 444,000 | 393,000 | 375,000 | 373,000 | 388,000 | 437,000 |
| Texas | 105,000 | 74,000 | 63,000 | 66,000 | 69,000 | 75,000 | 82,000 |
| Utah | 582,000 | 308,000 | 294,000 | 282,000 | 257,000 | 291,000 | 306,000 |
| Virginia | 1,146,000 | 929,000 | 971,000 | 922,000 | 958,000 | 1,031,000 | 1,054,000 |
| Washington | 256,000 | 194,000 | 222,000 | 203,000 | 170,000 | 180,000 | 170,000 |
| West Virginia | 10,135,000 | 8,026,000 | 7,911,000 | 7,872,000 | 9,017,000 | 9,861,000 | 10,580,000 |
| Wyoming | 766,000 | 477,000 | 464,000 | 328,000 | 352,000 | 352,000 | 377,000 |
| Other States | 27,000 | 22,000 | 19,000 | 20,000 | 14,000 | 15,000 | 16,000 |
| | 51,640,000 | 38,770,000 | 37,416,000 | 33,514,000 | 35,276,000 | 36,960,000 | 39,362,000 |

| State | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|
| Alabama | 1,762,000 | 1,827,000 | 1,937,000 | 1,868,000 | 1,998,000 | 20,004,000 |
| Arkansas | 105,000 | 113,000 | 129,000 | 133,000 | 132,000 | 1,220,000 |
| Colorado | 763,000 | 933,000 | 1,147,000 | 1,170,000 | 1,253,000 | 10,311,000 |
| Illinois | 5,431,000 | 5,518,000 | 7,048,000 | 6,745,000 | 7,661,000 | 66,909,000 |
| Indiana | 1,625,000 | 1,671,000 | 2,104,000 | 1,992,000 | 2,337,000 | 21,225,000 |
| Iowa | 370,000 | 372,000 | 480,000 | 466,000 | 495,000 | 4,715,000 |
| Kansas | 373,000 | 386,000 | 467,000 | 461,000 | 485,000 | 4,524,000 |
| Kentucky: | | | | | | |
| Eastern | 4,039,000 | 4,104,000 | 4,231,000 | 3,835,000 | 4,080,000 | 42,882,000 |
| Western | 1,176,000 | 1,177,000 | 1,310,000 | 1,385,000 | 1,526,000 | 12,187,000 |
| Maryland | 245,000 | 251,000 | 259,000 | 274,000 | 295,000 | 2,695,000 |
| Michigan | 60,000 | 71,000 | 87,000 | 84,000 | 111,000 | 808,000 |
| Missouri | 217,000 | 228,000 | 288,000 | 282,000 | 298,000 | 2,694,000 |
| Montana | 243,000 | 274,000 | 396,000 | 381,000 | 302,000 | 3,644,000 |
| New Mexico | 194,000 | 208,000 | 251,000 | 244,000 | 259,000 | 2,557,000 |
| North Dakota | 80,000 | 110,000 | 185,000 | 182,000 | 130,000 | 1,325,000 |
| Ohio | 2,293,000 | 2,470,000 | 2,858,000 | 2,851,000 | 2,799,000 | 28,034,000 |
| Oklahoma | 197,000 | 192,000 | 226,000 | 239,000 | 236,000 | 2,326,000 |
| Pennsylvania | 11,084,000 | 11,818,000 | 13,497,000 | 12,879,000 | 13,520,000 | 136,928,000 |
| Tennessee | 486,000 | 507,000 | 520,000 | 500,000 | 534,000 | 5,454,000 |
| Texas | 95,000 | 95,000 | 96,000 | 90,000 | 98,000 | 1,008,000 |
| Utah | 413,000 | 498,000 | 533,000 | 467,000 | 459,000 | 4,690,000 |
| Virginia | 1,128,000 | 1,174,000 | 1,209,000 | 1,137,000 | 1,141,000 | 12,800,000 |
| Washington | 212,000 | 226,000 | 236,000 | 234,000 | 235,000 | 2,538,000 |
| West Virginia | 11,529,000 | 11,674,000 | 12,541,000 | 11,828,000 | 11,407,000 | 122,381,000 |
| Wyoming | 495,000 | 639,000 | 850,000 | 747,000 | 706,000 | 6,553,000 |
| Other States | 18,000 | 20,000 | 22,000 | 23.000 | 25.000 | 241.000 |
| | 44,633,000 | 46,556,000 | 52,907,000 | 50,497,000 | 52,522,000 | 520,053,000 |

## MEN EMPLOYED

### METHOD OF COLLECTING EMPLOYMENT STATISTICS

The statistics of number of men employed presented in this report are based on the replies of operators in 1925 to the following questions:

Average number of men employed during year:
Underground—
Miners (hand or machine), loaders, shotfirers, and all others working at the "face"……
Haulage and track employees……
All other underground workers……
Surface (excluding coke and office workers)……

Total number employed……

For the mine operator to determine accurately "the average number of men employed" is not always easy. The ideal method, where the records available permit, would be to ascertain the total number of shifts or man days of labor during the year and divide this number by the number of days the mine worked. Now, the number of man days of day workers—that is, men paid by the day—can be ascertained from the mine pay roll, but to get the man days of the tonnage workers—the men paid by the piece—would require special records, which are maintained by few bituminous operators at the present time. At most bituminous mines no record is kept of the hours spent underground by the tonnage men, and the only evidence that a pick miner or loader had worked at all on a given day would be the presence of his check number on the weigh sheet, or possibly an entry in the foreman's attendance book. The lack of such a statement of the time worked by tonnage men is a serious handicap to the collection of accurate statistics of earnings, accident rates, volume of employment, attendance, and the productivity of labor and efficiency of management. That the difficulties in the way of keeping such a record are not insuperable is shown from the fact that it is made a regular part of the system of determining costs, owners' profits, and miners' wage rates now in effect in the coal-mining industry of Great Britain. The installation of such a record, developed on a plan that can be applied under American conditions of mining, is urged upon both employers and employees. Until it can be provided, measurements of all factors that involve the amount of labor expended will remain crude and subject to serious error.

In the absence of information on the number of man shifts worked, many operators calculate the average number of employed by averaging the numbers on the several pay rolls during the year. This method involves double counting to the extent that the same employees appear on the pay rolls of two or more mines in the same pay period—that is, duplication is introduced in proportion to the rapidity of labor turnover. Important as turnover may be in studies of labor relations and labor efficiency, it does not appear that the duplication introduced by it seriously impairs the value of the figures showing numbers employed. At a mine that works steadily during the year the average of the 24 semimonthly pay rolls will give a fairly accurate measure of the number employed. Where this method is used, pay-roll periods should not be included in which, because of a strike that lasts throughout the pay period or because of idleness through lack of market, the number of men drawing pay is only a small fraction of the normal working force. To include such a pay-roll period would artificially cut down the average number of men dependent for employment upon the mine, and it is clear from the returns that operators do not include such periods in calculating the average.

Many of the smaller operators do not even average the pay rolls for the year but rather set down the number of employees shown by the last pay roll.

Careful study of the returns under diverse conditions indicate the figures reported do not represent the average number of men actually at work at any one moment, nor the aggregate number of men who have worked at the mine during the year, nor the precise average number of men on the pay rolls, but rather the number of men commonly dependent on the mines for employment. They represent the number ordinarily reporting for work when the mine starts, plus the absentees—the men who have been working recently and will work again but who for one reason or another are not on hand that day. The totals for districts and for the United States are, therefore, a fair measure of the total number of coal-mine workers. These statistics are not accurate in all details, but they are comparable from year to year for each unit of the industry and represent the most accurate returns obtainable under present conditions, both as to the records generally available in mine offices and as to the funds allotted to the Bureau of Mines for collecting data.

The number employed at bituminous coal mines reached a maximum in 1923 when 704,793 men were reported. In 1924 there was a reduction of 85,000 men and in 1925 a further reduction of 31,000, the total number reported in 1925 being 588,493. Moreover, this figure of 588,493 includes the working force at mines that operated only a small part of the year. Mines continued to close as they had done in 1924, and the number of men at work at the end of 1925 was correspondingly reduced.

### CLASSIFICATION OF MINE EMPLOYEES

The employees engaged in coal mining fall into two groups. One group includes those who are directly engaged in winning the coal and who are paid by the piece at so much a ton. They are known collectively as "tonnage men," or often as "contract men," because each pieceworker in a sense is a contractor, obligating himself to get out coal and maintain his working place at a fixed rate of compensation. The tonnage men work underground.

The men in the other group are known collectively as "daymen," or sometimes as "company men." They are paid by the day. Their duties are concerned with the maintenance of the mine, with construction and repair work, with the operation of haulage and ventilation systems and the pumps, hoists, and power house, and with the work at the tipple, where the coal is dumped from mine car to railroad car and often cleaned, picked, or sized. The daymen are classified as "inside" and "outside" men, according to whether they work underground or on the surface.

In the anthracite region the terms "company men" and "contract men" are commonly applied to the two groups, and in the bituminous fields, though usage varies widely, the terms "tonnage men" and "daymen" are perhaps most frequently used.

There are exceptions to the statement that the men engaged directly in winning the coal are pieceworkers and that all others are paid according to time, for piece rates are sometimes applied to other tasks, and again men may be placed on the pay roll while engaged in mining a bit of difficult coal where their tonnage rate would not yield a living wage. Broadly, however, the distinction holds.

### TONNAGE AND DAYMEN, INSIDE AND OUTSIDE

Up to the present it has not been possible to collect complete statistics for the country of the numbers in each occupation at the mines, partly because of the great diversity in occupational classification from field to field, and partly because of the expense involved. Indeed, up to 1916 the only statistics of men employed collected by the United

States Geological Survey were the total number. In 1916 a division was made for the first time between underground and surface workers, and it was not until 1920 that the underground workers were further subdivided into tonnage men and daymen. Thanks to the zeal of W. W. Adams, accident statistician of the Bureau of Mines, the division into underground and surface workers has been carried back to 1911, partly by reference to State reports and to returns received by the bureau and partly by estimate.

To get approximate figures of the number of tonnage men, the Bureau of Mines asks operators to report the number of "miners, hand or machine, loaders, and shot firers." This grouping would include pick miners, loaders after machines, and operators of the cutting machines themselves, also the small group of shot firers who are commonly paid by the piece and who perform, in the districts where they are employed, a task that elsewhere is a part of the work of the miner himself. The figures for the group go back to 1920. The other men underground are virtually all daymen, and from 1920 to 1924 no subdivision of this group of "all other workers underground" is possible. The outside men are, with rare exceptions, all time-workers, though some are paid by the month rather than by the day.

In 1925 operators were asked to separate the inside daymen into "haulage and track employees" and "all others." The results are given in Table 32. It was found that about half the inside daymen in the bituminous mines and about two-fifths of those in the anthracite mines were engaged in haulage and track work. In the bituminous mines the tonnage men constituted 62.5 per cent of the total employed, the haulage and track men 11.6 per cent, other underground men 12 per cent, and outside men 13.9 per cent. In the anthracite mines the proportion of tonnage men is much less, the proportion of haulage and track men about the same, and the proportion of other inside men and of outside men much greater.

Those who seek more detailed records by occupations will find them in certain of the statements in mine inspectors' reports, in studies of the United States Coal Commission, and in the periodic investigations of wages and hours worked by the Federal Bureau of Labor Statistics. Unfortunately all these records are incomplete—either, as in the statements of the mine inspectors, because they cover only part of the country, or because they relate to only a sample list of mines.

## *Men employed in coal mines, by States, in 1925*

| State | Underground | | | | | | Surface | | Total number |
|---|---|---|---|---|---|---|---|---|---|
| | Miners, loaders, and shot firers | | Haulage and track | | All others | | | | |
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent | |
| Alabama | 15,596 | 57.6 | 3,251 | 12.0 | 3,792 | 14.0 | 4,458 | 16.4 | 27,097 |
| Alaska | 55 | 35.0 | 10 | 6.4 | 26 | 16.6 | 66 | 42.0 | 157 |
| Arkansas | 2,088 | 57.4 | 373 | 10.2 | 388 | 10.7 | 789 | 21.7 | 3,638 |
| California, Idaho, and Oregon | 21 | 50.0 | 3 | 7.1 | 5 | 11.9 | 13 | 31.0 | 42 |
| Colorado | 8,472 | 64.2 | 1,453 | 11.0 | 1,269 | 9.6 | 2,009 | 15.2 | 13,203 |
| Georgia | 37 | 27.0 | 11 | 8.0 | 19 | 13.9 | 70 | 51.1 | 137 |
| Illinois | 53,242 | 68.4 | 8,534 | 11.0 | 8,568 | 11.0 | 7,479 | 9.6 | 77,823 |
| Indiana | 14,412 | 63.4 | 2,928 | 12.9 | 2,031 | 8.9 | 3,361 | 14.8 | 22,732 |
| Iowa | 7,302 | 71.8 | 933 | 9.2 | 1,102 | 10.8 | 830 | 8.2 | 10,167 |
| Kansas | 5,462 | 70.0 | 558 | 7.2 | 592 | 7.6 | 1,188 | 15.2 | 7,800 |
| Kentucky | 33,216 | 58.2 | 7,361 | 12.9 | 7,462 | 13.1 | 8,985 | 15.8 | 57,024 |
| Maryland | 2,406 | 67.2 | 455 | 12.7 | 266 | 7.4 | 453 | 12.7 | 3,580 |
| Michigan | 1,028 | 65.1 | 280 | 17.7 | 132 | 8.4 | 139 | 8.8 | 1,579 |
| Missouri | 2,994 | 58.5 | 300 | 5.9 | 607 | 11.9 | 1,213 | 23.7 | 5,114 |
| Montana | 1,576 | 58.9 | 293 | 10.9 | 360 | 13.4 | 451 | 16.8 | 2,680 |
| New Mexico | 2,248 | 65.3 | 416 | 12.1 | 322 | 9.3 | 458 | 13.3 | 3,444 |
| North Carolina | 65 | 46.4 | 28 | 20.0 | 19 | 13.6 | 28 | 20.0 | 140 |
| North Dakota | 718 | 54.9 | 74 | 5.7 | 76 | 5.8 | 439 | 33.6 | 1,307 |
| Ohio | 27,544 | 69.5 | 3,347 | 8.4 | 3,935 | 9.9 | 4,832 | 12.2 | 39,658 |
| Oklahoma | 3,078 | 54.7 | 853 | 15.1 | 677 | 12.0 | 1,023 | 18.2 | 5,631 |
| Pennsylvania, bituminous | 103,698 | 66.1 | 14,697 | 9.4 | 19,067 | 12.2 | 19,336 | 12.3 | 156,798 |
| South Dakota | 49 | 100.0 | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| Tennessee | 5,171 | 62.2 | 1,059 | 12.7 | 825 | 9.9 | 1,259 | 15.2 | 8,314 |
| Texas | 1,406 | 66.7 | 194 | 9.2 | 193 | 9.2 | 315 | 14.9 | 2,108 |
| Utah | 2,570 | 57.9 | 585 | 13.2 | 451 | 10.1 | 835 | 18.8 | 4,441 |
| Virginia | 6,686 | 48.9 | 2,135 | 15.6 | 2,442 | 17.9 | 2,414 | 17.6 | 13,677 |
| Washington | 2,059 | 55.3 | 379 | 10.2 | 537 | 14.4 | 751 | 20.1 | 3,726 |
| West Virginia | 60,323 | 54.8 | 17,240 | 15.6 | 14,795 | 13.4 | 17,831 | 16.2 | 110,189 |
| Wyoming | 3,934 | 63.1 | 776 | 12.4 | 601 | 9.6 | 927 | 14.9 | 6,238 |
| Total bituminous | 367,456 | 62.5 | 68,526 | 11.6 | 70,559 | 12.0 | 81,952 | 13.9 | 588,493 |
| Pennsylvania anthracite | 78,773 | 49.1 | 17,000 | 10.6 | 24,795 | 15.5 | 39,744 | 24.8 | 160,312 |
| Grand total | 446,229 | 59.6 | 85,526 | 11.4 | 95,354 | 12.7 | 121,696 | 16.3 | 748,805 |

*Comparative number of employees in bituminous coal mines, 1922-1925*

| State | Average number employed | | | | Per cent of increase or decrease | | |
|---|---|---|---|---|---|---|---|
| | 1922 | 1923 | 1924 | 1925 | 1922 to 1925 | 1923 to 1925 | 1924 to 1925 |
| Alabama | 28,169 | 30,035 | 27,956 | 27,097 | —3.8 | —9.8 | —3.1 |
| Arkansas | 4,035 | 3,754 | 3,350 | 3,638 | —9.8 | —3.1 | +8.6 |
| Colorado | 13,506 | 13,340 | 12,954 | 13,203 | —2.2 | —1.0 | +1.9 |
| Illinois | 96,336 | 99,714 | 89,363 | 77,823 | —19.2 | —22.5 | —12.9 |
| Indiana | 33.208 | 35,408 | 27,558 | 22,732 | —31.6 | —35.8 | —17.5 |
| Iowa | 12,857 | 11,448 | 12,101 | 10,167 | —20.9 | —11.2 | —16.0 |
| Kansas | *7,359 | 9,761 | 8,561 | 7,800 | +6.0 | —4.2 | —.9 |
| Kentucky | 60,924 | 60,811 | 55,766 | 57,024 | —6.4 | —6.2 | +2.3 |
| Maryland | 3,755 | 3,725 | 3,776 | 3,580 | —4.7 | —3.9 | —5.2 |
| Michigan | 2.166 | 1,977 | 1,551 | 1,579 | —27.1 | —20.1 | +1.8 |
| Missouri | 8,750 | 6,952 | 5,977 | 5,114 | —41.5 | —26.4 | —14.4 |
| Montana | 3,635 | 3,511 | 3,196 | 2,680 | —26.3 | —23.6 | —16.1 |
| New Mexico | 4,001 | 4,095 | 4,206 | 3,444 | —13.9 | —15.9 | —18.1 |
| North Dakota | 1,648 | 1,621 | 1,298 | 1,307 | —20.7 | —19.3 | +.7 |
| Ohio | 54,194 | 54,555 | 44,229 | 39,658 | —26.8 | —27.3 | —10.3 |
| Oklahoma | 7.828 | 7,130 | 6,144 | 5,631 | —28.1 | —21.0 | —8.3 |
| Pennsylvania, bituminous | 188,838 | 194,981 | 169,322 | 156,798 | —17.0 | —19.6 | —7.4 |
| Tennessee | 11.449 | 11,244 | 9,365 | 8,314 | —27.4 | —26.0 | —11.2 |
| Texas | 2,841 | 2,452 | 2,195 | 2,108 | —25.8 | —14.0 | —4.0 |
| Utah | 4,721 | 4,381 | 4,330 | 4,441 | —5.9 | +1.4 | +2.6 |
| Virginia | 13,[illegible]09 | 14,120 | 12,679 | 13,677 | +2.1 | —3.1 | +7.9 |
| Washington | 4.481 | 4,306 | 3,858 | 3,726 | —16.8 | —13.5 | —3.4 |
| West Virginia | 110,014 | 117,300 | 102,203 | 110,189 | +.2 | —6.0 | +7.8 |
| Wyoming | 9,045 | 7,529 | 7,113 | 6,238 | —31.0 | —17.2 | —12.3 |
| Other States** | 799 | 643 | 553 | 525 | —34.3 | —18.3 | —5.1 |
| Total bituminous | 687.958 | 704,793 | 619,604 | 588.493 | —14.4 | —16.5 | —5.0 |
| Pennsylvania anthracite | 156,849 | 157,743 | 160,009 | 160,312 | +2.2 | +1.6 | +.2 |
| Grand total | 841.807 | 862,536 | 779,613 | 748.805 | —11.4 | —13.2 | —4.1 |

*Figures for Kansas in 1922 are probably incomplete. In comparison with 1919, when 9,926 men were employed, the year 1925 shows a decrease of 21.4 per cent.

**Includes Alaska, California, Georgia, Idaho, Nebraska (1924), North Carolina, Oregon, and South Dakota.

## DAYS WORKED BY MINES

*Average number of days worked by coal mines, by States, 1916-1925*

| State | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 |
|---|---|---|---|---|---|---|---|---|---|---|
| Alabama | 262 | 273 | 278 | 239 | 247 | 166 | 215 | 232 | 220 | 246 |
| Alaska | 179 | * | 254 | 280 | 240 | 244 | 147 | 220 | 287 | 243 |
| Arkansas | 184 | 187 | 204 | 136 | 176 | 112 | 81 | 97 | 134 | 112 |
| California* | 188 | 173 | 240 | 59 | 181 | 149 | 250 | 206 | 156 | 174 |
| Colorado | 233 | 263 | 255 | 225 | 255 | 164 | 191 | 174 | 178 | 192 |
| Georgia | 280 | 269 | 258 | 284 | 294 | 183 | 242 | 231 | 248 | 220 |
| Illinois | 198 | 243 | 238 | 160 | 213 | 152 | 120 | 158 | 148 | 161 |
| Indiana | 187 | 221 | 247 | 148 | 192 | 128 | 110 | 136 | 136 | 159 |
| Iowa | 202 | 251 | 245 | 176 | 250 | 148 | 131 | 181 | 161 | 153 |
| Kansas | 204 | 216 | 234 | 182 | 204 | 137 | 125 | 139 | 151 | 169 |
| Kentucky | 208 | 214 | 230 | 189 | 182 | 152 | 140 | 152 | 174 | 206 |
| Maryland | 256 | 254 | 261 | 179 | 207 | 120 | 101 | 178 | 173 | 209 |
| Michigan | 216 | 254 | 237 | 179 | 261 | 196 | 162 | 222 | 178 | 186 |
| Missouri | 207 | 240 | 235 | 175 | 233 | 166 | 113 | 155 | 135 | 166 |
| Montana | 244 | 268 | 264 | 194 | 250 | 143 | 140 | 179 | 173 | 171 |
| New Mexico | 292 | 321 | 301 | 273 | 302 | 150 | 216 | 216 | 204 | 202 |
| North Carolina | -- | --- | 40 | 100 | 288 | 300 | 167 | 275 | 287 | 272 |
| North Dakota | 244 | 255 | 229 | 216 | 218 | 194 | 175 | 182 | 165 | 153 |
| Ohio | 197 | 210 | 223 | 164 | 188 | 134 | 100 | 150 | 143 | 151 |
| Oklahoma | 178 | 211 | 228 | 184 | 217 | 141 | 114 | 133 | 124 | 153 |
| Oregon | 236 | 251 | 292 | 259 | 307 | * | * | * | * | * |
| Pennsylvania, bituminous | 259 | 261 | 269 | 218 | 244 | 151 | 154 | 213 | 180 | 200 |
| South Dakota | 145 | 154 | 145 | 164 | 133 | 129 | 138 | 122 | 138 | 143 |
| Tennessee | 239 | 241 | 265 | 201 | 234 | 154 | 163 | 183 | 159 | 211 |
| Texas | 218 | 203 | 262 | 227 | 242 | 139 | 185 | 178 | 166 | 150 |
| Utah | 228 | 219 | 258 | 239 | 252 | 151 | 204 | 160 | 182 | 179 |
| Virginia | 272 | 273 | 277 | 247 | 262 | 166 | 198 | 212 | 226 | 254 |
| Washington | 217 | 271 | 275 | 217 | 260 | 159 | 194 | 213 | 202 | 193 |
| West Virginia | 237 | 225 | 238 | 200 | 198 | 149 | 143 | 169 | 182 | 225 |
| Wyoming | 248 | 246 | 268 | 221 | 264 | 167 | 128 | 192 | 176 | 178 |
| Total bituminous | 230 | 243 | 249 | 195 | 220 | 149 | 142 | 179 | 171 | 195 |
| Pennsylvania anthracite | 253 | 285 | 293 | 266 | 271 | 271 | 151 | 268 | 274 | 182 |
| Grand total | 235 | 251 | 258 | 209 | 230 | 173 | 144 | 195 | 192 | 192 |

*California includes Idaho, 1916-1920; Idaho and Oregon, 1921-1923; Idaho, Nebraska, and Oregon in 1924; and Idaho and Oregon in 1925. The number of days was not reported for Alaska in 1917.

## LENGTH OF WORKING DAY

### ESTABLISHED WORKING DAY

In discussing the length of the working day in the coal mines of the United States it is necessary to distinguish between the established working day and the time actually spent at work by the men.

The established working day is now generally 8 hours. When market and other conditions permit, the mines work 6 days a week and the established working week is 48 hours. The next table classifies the bituminous mines according to the length of the established day. In 1925, out of 588,493 men, 541,822 were employed in mines where the established day was 8 hours.

In the unionized bituminous mines the 8-hour day has been in effect since 1898; in the unionized anthracite mines it was not introduced until 1916 and was not extended to certain minor occupations until 1923. Now, however, the basic 8-hour day is the rule for underground occupations in all the unionized mines, anthracite as well as bituminous.

The nonunion mines of the bituminous fields also have generally adopted the 8-hour day. It will be seen that in 1917 and 1918 there was rapid progress in the extension of the 8-hour day, and that since then more than 90 per cent of the men have been employed in 8-hour mines. There has, however, been a slight increase in the proportion in 9 and 10 hour mines in the last four years. The weighted average established working day for all the mines in 1925 was 8.08 hours.

*Number of bituminous coal mines having established working days of certain length and number of men employed in 1924 and 1925*

| State | 8 hours | | 9 hours | | 10 hours | | All others and not reporting* | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mines | Men | Mines | Men | Mines | Men | Mines | Men | Mines | Men |
| 1924 | | | | | | | | | | |
| Alabama | 112 | *9,209 | 83 | 14,390 | 28 | 4,017 | 15 | 340 | 238 | 27,956 |
| Alaska | 6 | 163 | ------ | ------ | ------ | ------ | 2 | 4 | 8 | 167 |
| Arkansas | 79 | 3,107 | 2 | 62 | 2 | 120 | 3 | 61 | 86 | 3,350 |
| California, Idaho Nebraska, and Oregon | 4 | 60 | ------ | ------ | ------ | ------ | 5 | 23 | 9 | 83 |
| Colorado | 159 | *12,434 | 3 | 290 | ------ | ------ | 69 | 230 | 231 | 12,954 |
| Georgia | 2 | 143 | ------ | ------ | ------ | ------ | ------ | ------ | 2 | 143 |
| Illinois | 396 | 88,950 | 2 | 13 | ------ | ------ | 90 | 400 | 488 | 89,363 |
| Indiana | 213 | 27,347 | 2 | 42 | ------ | ------ | 33 | 169 | 248 | 27,558 |
| Iowa | 179 | 11,617 | 1 | 6 | ------ | ------ | 76 | 478 | 256 | 12,101 |
| Kansas | 174 | 8,297 | ------ | ------ | ------ | ------ | 54 | 264 | 228 | 8,561 |
| Kentucky | 543 | *49,022 | 50 | 5,372 | 21 | 963 | 46 | 409 | 660 | 55,766 |
| Maryland | 74 | 3,599 | 1 | 27 | ------ | ------ | 18 | 150 | 93 | 3,776 |
| Michigan | 9 | 1,551 | ------ | ------ | ------ | ------ | ------ | ------ | 9 | 1,551 |
| Missouri | 111 | *5,802 | 2 | 97 | 1 | 10 | 13 | 68 | 127 | 5,977 |
| Montana | 33 | 3,006 | ------ | ------ | 1 | 38 | 34 | 152 | 68 | 3,196 |
| New Mexico | 35 | *4,185 | ------ | ------ | ------ | ------ | 7 | 21 | 42 | 4,206 |
| North Carolina | 2 | 120 | ------ | ------ | ------ | ------ | ------ | ------ | 2 | 120 |
| North Dakota | 48 | 848 | 2 | 23 | 6 | 142 | 76 | 285 | 132 | 1,298 |
| Ohio | 572 | 43,010 | 12 | 131 | 8 | 522 | 158 | 566 | 750 | 44,229 |
| Oklahoma | 84 | 5,804 | 4 | 212 | 2 | 87 | 4 | 41 | 94 | 6,144 |
| Pennsylvania | 1,862 | *163,162 | 78 | 4,836 | 11 | 404 | 171 | 920 | 2,122 | 169,322 |
| South Dakota | ------ | ------ | ------ | ------ | ------ | ------ | 16 | 40 | 16 | 40 |
| Tennessee | 133 | 8,860 | 2 | 465 | ------ | ------ | 4 | 40 | 139 | 9,365 |
| Texas | 26 | 1,073 | 8 | 421 | 2 | 39 | 8 | 662 | 44 | 2,195 |
| Utah | 37 | 4,318 | ------ | ------ | ------ | ------ | 2 | 12 | 39 | 4,330 |
| Virginia | 105 | *12,431 | 3 | 121 | 3 | 113 | 4 | 14 | 115 | 12,679 |
| Washington | 55 | 3,841 | ------ | ------ | ------ | ------ | 3 | 17 | 58 | 3,858 |
| West Virginia | 1,136 | 95,996 | 37 | 4,734 | 13 | 995 | 34 | 478 | 1,220 | 102,203 |
| Wyoming | 61 | *7,073 | ------ | ------ | ------ | ------ | 1 | 40 | 62 | 7,113 |
| | 6,250 | 575.028 | 292 | 31,242 | 98 | 7.450 | 946 | 5,884 | 7,586 | 619,604 |
| 1925 | | | | | | | | | | |
| Alabama | 78 | 7,230 | 71 | 13,511 | 29 | 3,458 | 61 | 2,898 | 239 | 27,097 |
| Alaska | 6 | 140 | ------ | ------ | ------ | ------ | 3 | 17 | 9 | 157 |
| Arkansas | 81 | 3,274 | 1 | 50 | 4 | 261 | 10 | 53 | 96 | 3,638 |
| California, Idaho and Oregon | 4 | 38 | 1 | 4 | ------ | ------ | ------ | ------ | 5 | 42 |
| Colorado | 155 | *12,808 | 3 | 180 | ------ | ------ | 71 | 215 | 229 | 13,203 |
| Georgia | 1 | 137 | ------ | ------ | ------ | ------ | ------ | ------ | 1 | 137 |
| Illinois | 371 | 77,132 | 1 | 5 | ------ | ------ | 94 | 686 | 466 | 77,823 |
| Indiana | 177 | 22,588 | 2 | 28 | ------ | ------ | 24 | 116 | 203 | 22,732 |
| Iowa | 154 | 9,946 | ------ | ------ | ------ | ------ | 53 | 221 | 207 | 10,167 |
| Kansas | 135 | *7,088 | 1 | 8 | ------ | ------ | 94 | 704 | 230 | 7,800 |
| Kentucky | 576 | *51,682 | 32 | 4,389 | 16 | 798 | 17 | 155 | 641 | 57,024 |
| Maryland | 71 | 3,508 | 1 | 26 | ------ | ------ | 16 | 46 | 88 | 3,580 |
| Michigan | 10 | 1,579 | ------ | ------ | ------ | ------ | ------ | ------ | 10 | 1,579 |
| Missouri | 100 | 4,480 | 5 | 124 | 1 | 17 | 48 | 493 | 154 | 5,114 |
| Montana | 32 | 2,541 | ------ | ------ | 1 | 69 | 19 | 70 | 52 | 2,680 |
| New Mexico | 28 | *3,272 | ------ | ------ | ------ | ------ | 10 | 172 | 38 | 3,444 |
| North Carolina | 2 | 140 | ------ | ------ | ------ | ------ | ------ | ------ | 2 | 140 |
| North Dakota | 56 | 870 | ------ | ------ | 7 | 136 | 89 | 301 | 152 | 1,307 |
| Ohio | 462 | 38,225 | 9 | 290 | 7 | 393 | 161 | 750 | 639 | 39,658 |
| Oklahoma | 90 | 5,198 | 4 | 272 | 3 | 146 | 3 | 15 | 100 | 5,631 |
| Pennsylvania | 1,759 | *151,764 | 67 | 4,103 | 6 | 114 | 142 | 817 | 1,974 | 156,798 |
| South Dakota | ------ | ------ | ------ | ------ | ------ | ------ | 17 | 49 | 17 | 49 |
| Tennessee | 102 | 7,417 | 2 | 262 | 1 | 248 | 6 | 387 | 111 | 8,314 |
| Texas | 15 | 839 | 13 | 501 | 1 | 222 | 8 | 546 | 37 | 2,108 |
| Utah | 41 | 4,441 | ------ | ------ | ------ | ------ | ------ | ------ | 41 | 4,441 |
| Virginia | 106 | 13,431 | 4 | 225 | 1 | 10 | 2 | 11 | 113 | 13,677 |
| Washington | 52 | 3,704 | ------ | ------ | ------ | ------ | 4 | 22 | 56 | 3,726 |
| West Virginia | 1,088 | *102,134 | 51 | 7,485 | 13 | 423 | 21 | 147 | 1,173 | 110,189 |
| Wyoming | 55 | 6,216 | 1 | 2 | ------ | ------ | 5 | 20 | 61 | 6,238 |
| | 5,807 | 541.822 | 269 | 31,465 | 90 | 6.295 | 978 | 8.911 | 7.144 | 588,493 |

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*Includes outside employees working 9 hours or 10 hours a day at certain mines where the established time for underground workers is 8 hours.

**Includes employees in mines where the established working day was changed during the year, or where the working day was irregular, or which failed to answer inquiry.

### AVERAGE TIME SPENT UNDERGROUND

The established working day, however, does not of itself measure the length of time the men actually work, because the mine may shut down before the full day is out, because the miner may go home before the mine stops, and because of the time spent by the man in going to and from his place of work underground. Allowing for these other factors, how much time does the man actually spend at work and how long is he underground?

As interpreted in the union wage agreements, the 8-hour day means 8 hours of labor at the usual working place, exclusive of time for lunch and exclusive of time spent in going from the entrance of the mine to the working place and back again. In general, this provision applies both to pieceworkers and day-wage workers underground, though certain classes of daymen have duties to be performed outside the eight hours. Motormen and drivers are ordinarily required to take motors and mules on their own time to and from the stables and the parting or station where they begin hauling, and this time is not counted as part of the day's labor.

Although the wage agreements specify eight hours of labor, it does not follow that men are always at work eight hours in the day. Shortage of railroad cars at the tipple, lack of orders, a petty strike, or a breakdown within the mine may cause the mine to stop before the eight hours are over. Time workers may lose fractional days through sickness or accident. In particular, the tonnage men who constitute 40 to 70 per cent of the working force may leave only before the mine work as a whole stops, because the custom of the industry allows them that freedom. Only in the rarest instances is a record kept of the time these men are in the mine. Sometimes they leave because they feel sick, or have other interests to attend to, or sometimes simply because they have earned enough for one day. The amount and the causes of this early quitting have been a subject of discussion and even of controversy between operators and employees.

The nominal working day, therefore, measures neither the length of time spent by the men at work nor the length of time they are underground; and it was not until recently, when the Federal Bureau of Labor Statistics made arrangements to obtain the necessary data, that any figures on these points were available. In connection with its periodic surveys of miners' earnings, the Bureau of Labor Statistics arranged to have a special record kept of the time actually spent in the mine by many thousands of tonnage men during typical biweekly pay periods. The results, which show the time spent at the working place and also the total time in the mine, will be found in the monthly Labor Review for July, 1925, pages 68 to 87, and for February, 1926, pages 77 to 87; and in Bulletins 316 and 416, all published by the Bureau of Labor Statistics, United States Department of Labor.

## OUTPUT PER MAN

*Coal produced per man and average number of days worked per year, by States, 1923-1295*

| State | 1923 | | | 1924 | | | 1925 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Days mines worked | Average tonnage per man | | Days mines worked | Average tonnage per man | | Days mines worked | Average tonnage per man | |
| | | Per day | Per year | | Per year | Per day | | Per year | Per day |
| Alabama | 232 | 680 | 2.93 | 220 | 684 | 3.11 | 246 | 738 | 3.00 |
| Arkansas | 97 | 329 | 3.39 | 134 | 433 | 3.24 | 112 | 335 | 2.99 |
| Colorado | 174 | 774 | *4.45 | 178 | 806 | *4.52 | 189 | 781 | *4.07 |
| Illinois | 158 | 795 | 5.02 | 148 | 765 | 5.16 | 161 | 860 | 5.33 |
| Indiana | 136 | 738 | 5.43 | 136 | 779 | 5.75 | 159 | 934 | 5.89 |
| Iowa | 181 | 498 | 2.75 | 161 | 452 | 2.80 | 153 | 464 | 3.02 |
| Kansas | 139 | 443 | 3.19 | 151 | 496 | 3.29 | 169 | 580 | 3.44 |
| Kentucky | 152 | 735 | 4.83 | 174 | 810 | 4.67 | 206 | 966 | 4.68 |
| Maryland | 178 | 608 | 3.42 | 173 | 565 | 3.27 | 209 | 753 | 3.61 |
| Michigan | 222 | 593 | 2.67 | 178 | 536 | 3.00 | 186 | 512 | 2.75 |
| Missouri | 155 | 477 | 3.07 | 135 | 415 | 3.08 | 166 | 527 | 3.18 |
| Montana | 179 | 896 | 5.00 | 173 | 909 | 5.26 | 171 | 1,136 | 6.64 |
| New Mexico | 216 | 708 | 3.28 | 204 | 662 | 3.25 | 202 | 742 | 3.68 |
| North Dakota | 182 | 837 | 4.60 | 165 | 925 | 5.62 | 153 | 1,013 | 6.61 |
| Ohio | 150 | 742 | 4.95 | 143 | 689 | 4.82 | 151 | 707 | 4.67 |
| Oklahoma | 133 | 398 | 2.99 | 124 | 379 | 3.05 | 153 | 413 | 2.70 |
| Pennsylvania, bituminous | 213 | 882 | 4.15 | 180 | 772 | 4.27 | 200 | 873 | 4.36 |
| Tennessee | 183 | 536 | 2.93 | 159 | 487 | 3.05 | 211 | 656 | 3.11 |
| Texas | 178 | 484 | 2.72 | 166 | 523 | 3.16 | 150 | 478 | 3.19 |
| Utah | 160 | 1,077 | *6.73 | 182 | 1,037 | *5.70 | 179 | 1,056 | *5.90 |
| Virginia | 212 | 832 | 3.92 | 226 | 843 | 3.73 | 254 | 936 | 3.69 |
| Washington | 213 | 680 | 3.19 | 202 | 688 | 3.41 | 193 | 681 | 3.52 |
| West Virginia | 169 | 919 | 5.44 | 182 | 995 | 5.48 | 225 | 1,111 | 4.94 |
| Wyoming | 192 | 1,004 | 5.23 | 176 | 950 | 5.41 | 178 | 1,051 | 5.90 |
| Total bituminous | 179 | 801 | 4.47 | 171 | 781 | 4.56 | 195 | 884 | 4.52 |
| Pennsylvania anthracite | 268 | 592 | 2.21 | 274 | 550 | 2.00 | 182 | 386 | 2.12 |
| Grand total | 195 | 763 | 3.91 | 192 | 733 | 3.81 | 192 | 177 | 4.04 |

*Probably too high because of practice common in some districts of men going into mine to shoot coal and load mine cars on days when tipples or mines as a whole are not in operation.

*Strikes, suspensions, and lockouts in coal mines, by States, 1923-1925*

| State | 1923 | | | | | 1924 | | | | | 1925 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total number of men employed | Number of men on strike | Man days idle on account of strike | Average number of days lost on account of strike | | Total number of men employed | Number of men on strike | Man days idle on account of strike | Average number of days lost on account of strike | | Total number of men employed | Number of men on strike | Man days idle on account of strike | Average number of days lost on account of strike | |
| | | | | Per man employed | Per man on strike | | | | Per man employed | Per man on strike | | | | Per man employed | Per man on strike |
| Alabama | 20,035 | ----- | ----- | ----- | ----- | 27,956 | ----- | ----- | ----- | ----- | 27,097 | ----- | ----- | ----- | ----- |
| Arkansas | 3,754 | 324 | 9,009 | 2 | 28 | 3,350 | 1,076 | 29,272 | 9 | 27 | 3,638 | 560 | 41,928 | 12 | 75 |
| Colorado | 13,340 | ----- | ----- | ----- | ----- | 12,954 | 120 | 840 | * | 7 | 13,203 | 595 | 6,943 | * | 12 |
| Illinois | 99,714 | 7,474 | 95,458 | 1 | 13 | 89,363 | 4,217 | 50,101 | 1 | 12 | 77,823 | 4,870 | 25,180 | * | 5 |
| Indiana | 35,408 | 10,765 | 104,604 | 3 | 10 | 27,558 | 7,699 | 159,743 | 6 | 21 | 22,732 | 7,919 | 96,963 | 4 | 12 |
| Iowa | 11,448 | 1,946 | 19,874 | 2 | 10 | 12,101 | 986 | 16,445 | 1 | 17 | 10,167 | 1,267 | 3,740 | * | 3 |
| Kansas | 9,761 | 949 | 24,741 | 3 | 26 | 8,561 | 2,706 | 118,918 | 14 | 44 | 7,800 | 530 | 8,080 | 1 | 15 |
| Kentucky | 60,811 | 2,699 | 92,035 | 2 | 34 | 55,766 | 8,938 | 1,735,739 | 31 | 194 | 57,024 | 1,954 | 162,534 | 3 | 83 |
| Maryland | 3,725 | 2,686 | 359,920 | 97 | 134 | 3,776 | 168 | 504 | * | 3 | 3,580 | ----- | ----- | ----- | ----- |
| Michigan | 1,977 | 786 | 3,992 | 2 | 5 | 1,551 | 425 | 1,525 | 1 | 4 | 1,579 | 725 | 5,575 | 4 | 8 |
| Missouri | 6,952 | 312 | 10,857 | 2 | 35 | 5,977 | 1,580 | 76,660 | 13 | 49 | 5,114 | 110 | 1,287 | * | 12 |
| Montana | 3,511 | 25 | 25 | * | * | 3,196 | 17 | 53 | * | 3 | 2,680 | ----- | ----- | ----- | ----- |
| New Mexico | 4,095 | ----- | ----- | ----- | ----- | 4,206 | ----- | ----- | ----- | ----- | 3,444 | ----- | ----- | ----- | ----- |
| North Dakota | 1,621 | 85 | 6,933 | 4 | 82 | 1,298 | ----- | ----- | ----- | ----- | 1,307 | ----- | ----- | ----- | ----- |
| Ohio | 54,555 | 16,486 | 203,161 | 4 | 12 | 44,229 | 10,256 | 217,752 | 5 | 21 | 39,658 | 6,572 | 170,208 | 4 | 26 |
| Oklahoma | 7,130 | 1,020 | 8,211 | 1 | 8 | 6,144 | 1,318 | 144,607 | 24 | 110 | 5,631 | 352 | 16,773 | 3 | 48 |
| Pennsylvania, bituminous | 194,981 | 10,984 | 157,130 | 1 | 14 | 169,322 | 8,793 | 361,226 | 2 | 41 | 156,798 | 7,414 | 234,389 | 1 | 32 |
| Tennessee | 11,244 | 572 | 24,766 | 2 | 43 | 9,365 | 2,134 | 244,945 | 26 | 115 | 8,314 | 250 | 2,350 | * | 9 |
| Texas | 2,452 | 137 | 18,141 | 7 | 132 | 2,195 | ----- | ----- | ----- | ----- | 2,108 | 87 | 261 | * | 3 |
| Utah | 4,381 | ----- | ----- | ----- | ----- | 4,330 | 58 | 310 | * | 5 | 4,441 | 280 | 10,920 | 2 | 39 |
| Virginia | 14,120 | ----- | ----- | ----- | ----- | 12,679 | ----- | ----- | ----- | ----- | 13,677 | ----- | ----- | ----- | ----- |
| Washington | 4,306 | 1,754 | 50,681 | 12 | 29 | 3,858 | ----- | ----- | ----- | ----- | 3,726 | ----- | ----- | ----- | ----- |
| West Virginia | 117,300 | 2,625 | 49,587 | * | 19 | 102,203 | 7,688 | 1,060,478 | 10 | 138 | 110,189 | 4,956 | 376,399 | 3 | 76 |
| Wyoming | 7,529 | ----- | ----- | ----- | ----- | 7,113 | ----- | ----- | ----- | ----- | 6,238 | ----- | ----- | ----- | ----- |
| Other States | 643 | ----- | ----- | ----- | ----- | 553 | ----- | ----- | ----- | ----- | 525 | ----- | ----- | ----- | ----- |
| Total bituminous | 704,793 | 61,629 | 1,239,125 | 2 | 20 | 619,604 | 58,179 | 4,219,118 | 7 | 73 | 588,493 | 38,441 | 1,163,530 | 2 | 30 |
| Pennsylvania anthracite | 157,743 | 135,585 | 2,629,418 | 17 | 19 | 160,009 | 71,273 | 1,143,630 | 7 | 16 | 160,312 | 147,928 | 15,269,506 | 95 | 103 |
| Grand total | 862,536 | 197,214 | 3,868,542 | 4 | 20 | 779,613 | 129,452 | 5,362,748 | 7 | 41 | 748,805 | 186,369 | 16,433,036 | 22 | 88 |

*One-half day or less.

## UNDERGROUND HAULAGE EQUIPMENT

The high degree to which mechanization of the bituminous coal mines is being carried is indicated by a special study, made by the bureau, of methods of underground haulage used in 1924. The following analysis is adapted from an article, by a member of the bureau, published in Coal Age.* Of the 7,361 deep mines in operation during 1924 there were 3,585 producing 88 per cent of the output that reported the use of locomotives of some type underground. The mines not using locomotives, although numbering 3,776, produced only 12 per cent of the output.

A total of 3,377 mines reported one or more electric locomotives, and these mines produced 85.6 per cent of the output.

There were 14,723 locomotives of all types used underground during the year, of which 14,280 were electric, 85 compressed air, 226 gasoline, and 132 steam. The total number of animals employed underground was 36,352 and in addition there were 649 rope haulage units.

### SOURCE OF INFORMATION

The information presented herewith was obtained through a question on the bureau's annual statistical report card for 1924 which was sent to all producers with an output of more than 2,000 tons. It covers all mines in operation during the year. A few operators failed to answer the question, but these gaps were partly filled by the data relating to haulage in the 1925 edition of The Coal Catalog, issued by the Keystone Consolidated Publishing Co., Pittsburgh.

Information was obtained from 5,703 out of the 7,361 deep mines that operated during 1924. The remaining 1,658 were largely "local commercial" mines with an annual output of less than 2,000 tons, from which an answer was not asked. To make the figures complete, estimates of the number of animals used by these local mines have been included in the totals. As these mines produced only 2.5 per cent of the output, the possible error introduced by the estimates is negligible.

The haulage equipment of stripping pits, of which 225 were in operation in 1924, and such equipment of deep mines as is used only on the surface are not included in the statistics.

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*Rogers, H. O., "Exit the mule": Coal Age, August, 1927, vol. 32, pp. 84-88.

## Changes Since 1924

The figures give the first complete picture of the extent of the mechanization of haulage over the country as a whole. Further progress has undoubtedly been made since 1924, under the pressure to reduce costs caused by market conditions of the last three years. Statistics for 1927 would show a still higher percentage mined by use of locomotives and further gains of electric haulage at the expense of other types.

### NUMBER OF HAULAGE UNITS

The next table shows, by States, the number of underground haulage units in use in bituminous coal mines in 1924. Mine mules are still widely employed, but the number of animals of all kinds underground is a very small factor in the demand for work animals, for the total number of horses and mules in the country is about 24,000,000. Included in the 36,352 mine animals are a few dogs used in small mines working thin coal.

*Total number of underground haulage units used in bituminous coal mines in 1924*

| State | Animals | Rope haulage units* | Storage battery locomotives: With trolley | Storage battery locomotives: Without trolley | Electric trolley locomotives | Compressed air locomotives | Gasoline locomotives** | Steam locomotives** | Total number of locomotives |
|---|---|---|---|---|---|---|---|---|---|
| Alabama | 1,928 | 56 | 13 | 29 | 305 | 1 | 38 | 8 | 394 |
| Alaska | 21 |  |  |  |  |  |  |  |  |
| Arkansas | 317 | 13 |  | 2 | 7 |  | 4 |  | 13 |
| California | 6 |  |  |  |  |  |  |  |  |
| Colorado | 1,703 | 144 | 5 | 20 | 118 | 2 | 2 | 6 | 153 |
| Georgia | 13 |  |  |  |  |  |  |  |  |
| Idaho | 1 |  |  |  |  |  |  |  |  |
| Illinois | 4,378 | 14 | 85 | 304 | 1,153 |  | 15 | 6 | 1,563 |
| Indiana | 1,744 |  | 40 | 99 | 345 |  | 3 | 13 | 500 |
| Iowa | 979 | 31 | 4 | 2 | 58 |  | 2 |  | 66 |
| Kansas | 522 |  | 13 | 38 | 12 |  | 1 | 15 | 79 |
| Kentucky | 2,980 | 7 | 133 | 137 | 1,182 | 2 | 6 | 5 | 1,465 |
| Maryland | 299 | 2 | 5 | 4 | 76 |  | 4 | 1 | 90 |
| Michigan | 95 |  |  | 5 | 34 |  |  |  | 39 |
| Missouri | 317 | 2 | 2 | 9 | 10 |  | 2 |  | 23 |
| Montana | 271 | 3 | 4 | 3 | 55 |  | 1 | 1 | 64 |
| Nebraska | 1 |  |  |  |  |  |  |  |  |
| New Mexico | 449 | 51 | 8 | 2 | 66 |  | 2 |  | 78 |
| North Carolina | 6 | 2 |  |  |  |  |  |  |  |
| North Dakota | 173 |  |  |  | 5 |  | 2 | 1 | 8 |
| Ohio | 2,493 | 10 | 61 | 88 | 631 | 1 | 5 |  | 786 |
| Oklahoma | 548 | 5 | 1 | 8 | 8 |  |  |  | 17 |
| Oregon | 4 |  |  |  |  |  |  |  |  |
| Pennsylvania | 8,843 | 170 | 176 | 276 | 3,559 | 42 | 61 | 36 | 4,150 |
| South Dakota | 16 |  |  |  |  |  |  |  |  |
| Tennessee | 649 | 9 | 6 | 12 | 182 |  | 26 | 5 | 231 |
| Texas | 157 | 2 |  | 3 | 10 |  | 7 | 1 | 21 |
| Utah | 373 | 17 | 9 | 1 | 66 |  |  |  | 76 |
| Virginia | 478 | 3 | 18 | 36 | 460 |  | 3 | 9 | 526 |
| Washington | 147 | 7 | 4 | 15 | 67 |  | 4 | 4 | 94 |
| West Virginia | 5,906 | 12 | 188 | 419 | 3,477 | 36 | 38 | 21 | 4,179 |
| Wyoming | 533 | 89 | 4 | 3 | 100 | 1 |  |  | 108 |
|  | 36,352 | 649 | 779 | 1,515 | 11,986 | 85 | 226 | 132 | 14,723 |

*Does not include rope hoists on main slopes. Data unsatisfactory because of misunderstanding of questionnaire.

**The figures for gasoline and steam locomotives do not include a large number employed exclusively on the surface.

*Number and production of bituminous coal mines, classified by methods of underground haulage employed, by States, in 1924*

| State | Animals only (including a few mines also using ropes) | | | | Locomotives only (including a few mines also using ropes) | | | | Locomotives and animals (including a few mines also using ropes) | | | | | Strip operations | | Total all mines | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of mines | Number of animals | Number of rope units | Production (net tons) | Number of mines | Number of locomotives | Number of rope units | Production (net tons) | Number of mines | Number of animals | Number of locomotives | Number of rope units | Production (net tons) | Number of mines | Production (net tons) | Number of mines | Production (net tons) |
| Alabama | 138 | 1,153 | 31 | 5,688,782 | 36 | 199 | 14 | 6,439,958 | 56 | 775 | 195 | 11 | 6,631,363 | 8 | 370,081 | 238 | 19,130,184 |
| Alaska | 8 | 21 | ------ | 99,663 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | | ------ | 8 | 99,663 |
| Arkansas | 66 | 302 | 12 | 1,089,215 | 5 | 10 | ------ | 41,282 | 5 | 15 | 3 | 1 | 97,699 | 10 | 223,307 | 86 | 1,451,503 |
| Colorado | 175 | 753 | 83 | 3,877,309 | 9 | 21 | 7 | 618,973 | 47 | 950 | 132 | 54 | 5,947,816 | | ------ | 231 | 10,444,098 |
| Georgia | 2 | 13 | ------ | 9,290 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | | 65,657 | 2 | 74,947 |
| Illinois | 234 | 1,008 | 12 | 3,196,859 | 36 | 543 | ------ | 15,749,210 | 201 | 3,370 | 1,020 | 2 | 47,081,352 | 17 | 2,295,860 | 488 | 68,323,281 |
| Indiana | 115 | 506 | ------ | 2,772,485 | 29 | 236 | ------ | 5,096,032 | 77 | 1,238 | 264 | ------ | 11,100,507 | 27 | 2,511,189 | 248 | 21,480,213 |
| Iowa | 228 | 614 | 31 | 2,714,790 | 2 | 4 | ------ | 105,842 | 26 | 365 | 62 | ------ | 2,647,418 | | 400 | 256 | 5,468,450 |
| Kansas | 177 | 380 | ------ | 1,697,971 | 6 | 39 | ------ | 594,066 | 19 | 142 | 40 | ------ | 1,160,622 | 26 | 795,074 | 228 | 4,247,733 |
| Kentucky | 254 | 929 | ------ | 3,175,701 | 224 | 893 | 2 | 23,416,838 | 169 | 2,051 | 572 | 5 | 17,253,810 | 13 | 1,300,855 | 660 | 45,147,204 |
| Maryland | 56 | 152 | ------ | 616,535 | 12 | 33 | ------ | 296,374 | 25 | 147 | 57 | 2 | 1,220,794 | | ------ | 93 | 2,133,703 |
| Michigan | 1 | 1 | ------ | 3,500 | 2 | 11 | ------ | 269,764 | 6 | 94 | 28 | ------ | 557,756 | | ------ | 9 | 831,020 |
| Missouri | 96 | 276 | 2 | 1,158,306 | 6 | 14 | ------ | 135,175 | 6 | 39 | 9 | ------ | 207,699 | 19 | 979,700 | 127 | 2,480,880 |
| Montana | 51 | 86 | 1 | 298,379 | 3 | 24 | 2 | 653,403 | 13 | 185 | 40 | ------ | 1,760,211 | 1 | 193,372 | 68 | 2,905,365 |
| New Mexico | 24 | 59 | 11 | 445,520 | ------ | ------ | ------ | ------ | 18 | 390 | 78 | 40 | 2,340,543 | -- | ------ | 42 | 2,786,063 |
| North Carolina | 2 | 6 | 2 | 57,094 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | | ------ | 2 | 57,094 |
| North Dakota | 115 | 144 | ------ | 480,561 | 1 | 1 | ------ | 23,684 | 3 | 29 | 7 | ------ | 262,098 | 13 | 434,184 | 132 | 1,200,527 |
| Ohio | 417 | 828 | 3 | 4,101,785 | 76 | 315 | 2 | 5,410,312 | 207 | 1,665 | 471 | 5 | 18,094,227 | 50 | 2,866,683 | 750 | 30,473,007 |
| Oklahoma | 72 | 409 | 5 | 1,553,042 | 1 | 3 | ------ | 60,000 | 9 | 139 | 14 | ------ | 404,464 | 12 | 312,109 | 94 | 2,329,615 |
| Pennsylvania | 1,005 | 2,989 | 39 | 13,875,785 | 558 | 2,160 | 62 | 43,975,626 | 535 | 5,854 | 1,990 | 69 | 71,879,544 | 24 | 902,818 | 2,122 | 130,633,773 |
| South Dakota | 16 | 16 | ------ | 12,043 | | ------ | ------ | ------ | -- | ------ | ------ | ------ | ------ | - | ------ | 16 | 12,043 |
| Tennessee | 72 | 241 | 2 | 678,904 | 13 | 71 | ------ | 893,122 | 54 | 408 | 160 | 7 | 2,984,529 | | ------ | 139 | 4,556,555 |
| Texas | 35 | 116 | 1 | 733,406 | 2 | 10 | ------ | 51,006 | 6 | 41 | 11 | 1 | 251,482 | 1 | 111,117 | 44 | 1,147,011 |
| Utah | 17 | 63 | 1 | 338,067 | 2 | 13 | 1 | 527,936 | 20 | 310 | 63 | 15 | 3,622,154 | | ------ | 39 | 4,488,157 |
| Virginia | 40 | 132 | 1 | 354,177 | 45 | 348 | ------ | 6,715,879 | 30 | 346 | 178 | 2 | 3,623,408 | | ------ | 115 | 10,693,464 |
| Washington | 36 | 82 | 3 | 598,855 | 11 | 44 | 1 | 850,041 | 11 | 67 | 50 | 3 | 1,204,771 | | ------ | 58 | 2,653,667 |
| West Virginia | 280 | 1,054 | 3 | 4,663,222 | 431 | 2,256 | 8 | 48,189,884 | 505 | 4,852 | 1,923 | 1 | 48,565,343 | 4 | 244,448 | 1,220 | 101,662,897 |
| Wyoming | 35 | 223 | 10 | 2,101,883 | 2 | 7 | ------ | 172,523 | 25 | 310 | 101 | 79 | 4,483,062 | | ------ | 62 | 6,757,468 |
| Other States* | 9 | 12 | | 16,853 | | | | ------ | | | | | | | 100 | 9 | 16,953 |
| | 3,776 | 12,570 | 253 | 56,409,982 | 1,512 | 7,255 | 99 | 160,286,930 | 2,073 | 23,782 | 7,468 | 297 | 253,382,672 | 225 | 13,606,954 | 7,586 | 483,686,538 |

*Includes California, Idaho, Nebraska, and Oregon.

*Per cent of deep-mined bituminous coal produced by the three major methods of haulage employed, in 1924*

| State | Produced in mines using— Animals only (including a few mines also using ropes) | Produced in mines using— Locomotives and animals (including a few mines also using ropes) | Produced in mines using— Locomotives only (including a few mines also using ropes) |
|---|---|---|---|
| | *Per cent* | *Per cent* | *Per cent* |
| Alabama | 30.3 | 34.3 | 35.4 |
| Alaska | 100.0 | ---------- | ---------- |
| California | 75.0 | 3.3 | 21.7 |
| Arkansas | 100.0 | ---------- | ---------- |
| Colorado | 37.1 | 5.9 | 57.0 |
| Georgia | 100.0 | ---------- | ---------- |
| Illinois | 4.8 | 23.9 | 71.3 |
| Indiana | 14.6 | 26.9 | 58.5 |
| Iowa | 49.7 | 1.9 | 48.4 |
| Kansas | 49.2 | 17.2 | 33.6 |
| Kentucky | 7.2 | 53.4 | 39.4 |
| Maryland | 28.9 | 13.9 | 57.2 |
| Michigan | .4 | 32.5 | 67.1 |
| Missouri | 77.1 | 9.0 | 13.9 |
| Montana | 11.0 | 24.1 | 64.9 |
| New Mexico | 16.0 | ---------- | 84.0 |

| State | Produced in mines using— Animals only (including a few mines also using ropes) | Produced in mines using— Locomotives only (including a few mines also using ropes) | Produced in mines using— Locomotives and animals (including a few mines also using ropes) |
|---|---|---|---|
| | *Per cent* | *Per cent* | *Per cent* |
| North Dakota | 62.7 | 3.1 | 34.2 |
| Ohio | 14.9 | 19.6 | 65.5 |
| Oklahoma | 77.0 | 3.0 | 20.0 |
| Oregon | 100.0 | ---------- | ---------- |
| Pennsylvania | 10.7 | 33.9 | 55.4 |
| Tennessee | 14.9 | 19.6 | 65.5 |
| Texas | 70.8 | 4.9 | 24.3 |
| Utah | 7.5 | 11.8 | 80.7 |
| Virginia | 3.3 | 62.8 | 33.9 |
| Washington | 22.6 | 32.0 | 45.4 |
| West Virginia | 4.6 | 47.5 | 47.9 |
| Wyoming | 31.1 | 2.5 | 66.4 |
| Other States | 100.0 | ---------- | ---------- |
| | 12.0 | 34.1 | 53.9 |

*Production and per cent of total output of deep-mined bituminous coal by mines using electric locomotives with those using all other methods of haulage, in 1924*

| State | Mines using one or more electric locomotives | | | | Mines using no electric locomotives | | | Total deep mines | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of mines | Number of electric locomotives, all types | Production (net tons) | Per cent of production | Number of mines | Production (net tons) | Per cent of production | Number of mines | Production (net tons) |
| Alabama | 59 | 347 | 11,919,285 | 63.5 | 171 | 6,840,818 | 36.5 | 230 | 18,760,103 |
| Alaska | ---------- | ---------- | ---------- | ---------- | 8 | 99,663 | 100.0 | 8 | 99,663 |
| Arkansas | 9 | 9 | 138,981 | 11.3 | 67 | 1,089,215 | 88.7 | 76 | 1,228,196 |
| California | ---------- | ---------- | ---------- | ---------- | 6 | 1,425 | 100.0 | 6 | 1,425 |
| Colorado | 51 | 143 | 6,469,461 | 61.9 | 180 | 3,974,637 | 38.1 | 231 | 10,444,098 |
| Illinois | 232 | 1,542 | 62,620,071 | 94.8 | 239 | 3,407,350 | 5.2 | 471 | 66,027,421 |
| Indiana | 105 | 484 | 15,846,879 | 83.5 | 116 | 3,122,145 | 16.5 | 221 | 18,969,024 |
| Iowa | 28 | 64 | 2,830,912 | 51.8 | 228 | 2,637,138 | 48.2 | 256 | 5,468,050 |
| Kansas | 25 | 63 | 1,691,875 | 49.0 | 177 | 1,760,784 | 51.0 | 202 | 3,452,659 |
| Kentucky | 374 | 1,452 | 40,041,675 | 91.3 | 273 | 3,804,674 | 8.7 | 647 | 43,846,349 |
| Maryland | 31 | 85 | 1,381,149 | 64.7 | 62 | 752,554 | 35.3 | 93 | 2,133,703 |
| Michigan | 8 | 39 | 827,520 | 99.6 | 1 | 3,500 | .4 | 9 | 831,020 |
| Missouri | 10 | 21 | 332,970 | 22.2 | 98 | 1,168,210 | 77.8 | 108 | 1,501,180 |
| Montana | 15 | 62 | 2,409,949 | 88.8 | 52 | 302,044 | 11.2 | 67 | 2,711,993 |
| New Mexico | 10 | 76 | 2,277,467 | 81.7 | 32 | 508,596 | 18.3 | 42 | 2,786,063 |
| North Dakota | 2 | 5 | 238,063 | 31.1 | 117 | 528,280 | 68.9 | 119 | 766,343 |
| Ohio | 284 | 780 | 23,545,538 | 85.3 | 416 | 4,060,786 | 14.7 | 700 | 27,606,324 |
| Oklahoma | 9 | 17 | 464,464 | 23.0 | 73 | 1,553,042 | 77.0 | 82 | 2,017,506 |
| Pennsylvania | 1,047 | 4,011 | 113,087,561 | 87.2 | 1,051 | 16,643,394 | 12.8 | 2,098 | 129,730,955 |
| South Dakota | ---------- | ---------- | ---------- | --- | 16 | 12,043 | 100.0 | 16 | 12,043 |
| Tennessee | 46 | 200 | 2,515,631 | 55.2 | 93 | 2,040,924 | 44.8 | 139 | 4,556,555 |
| Texas | 4 | 13 | 115,634 | 11.2 | 39 | 920,260 | 88.8 | 43 | 1,035,894 |
| Utah | 21 | 76 | 4,197,600 | 93.5 | 18 | 290,557 | 6.5 | 39 | 4,488,157 |
| Virginia | 71 | 514 | 10,209,198 | 95.5 | 44 | 484,266 | 4.5 | 115 | 10,693,464 |
| Washington | 18 | 86 | 1,756,800 | 66.2 | 40 | 896,867 | 33.8 | 58 | 2,653,667 |
| West Virginia | 891 | 4,084 | 92,945,773 | 91.6 | 325 | 8,472,676 | 8.4 | 1,216 | 101,418,449 |
| Wyoming | 27 | 107 | 4,655,585 | 68.9 | 35 | 2,101,883 | 31.1 | 62 | 6,757,468 |
| Other States* | ---------- | ---------- | ---------- | ---------- | 7 | 81,812 | 100.0 | 7 | 81,812 |
| | 3.377 | 14.280 | 402.520.041 | 85.6 | 3.984 | 67.559.543 | 14.4 | 7.361 | 470.079.584 |

*Includes Georgia, Idaho, Nebraska, North Carolina, and Oregon.

## MINING METHODS

*Bituminous coal mined by different methods, by States, 1924 and 1925*

| State | Mined by hand |  | Shot off the solid |  | Cut by machines |  | From strip pits |  | Not specified |  | Total production (net tons) |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Net tons | Percentage | Net tons | Percentage | Net tons | Percentage | Net tons | Percentage | Net tons | Percentage |  |
| 1924 |  |  |  |  |  |  |  |  |  |  |  |
| Alabama | 3,004,923 | 15.7 | 6,004,886 | 31.4 | 9,704,205 | 50.7 | 370,081 | 1.9 | 46,089 | 0.3 | 19,130,184 |
| Alaska | 9,966 | 10.0 | 89,697 | 90.0 |  |  |  |  |  |  | 99,663 |
| Arkansas | 21,732 | 1.5 | 848,616 | 58.5 | 357,648 | 24.6 | 223,307 | 15.4 | 200 |  | 1,451,503 |
| Colorado | 4,053,426 | 38.8 | 933,651 | 9.0 | 5,327,817 | 51.0 |  |  | 129,204 | 1.2 | 10,444,098 |
| Georgia |  |  | 9,290 | 12.4 |  |  | 65,657 | 87.6 |  |  | 74,947 |
| Illinois | 2,276,118 | 3.3 | 14,615,745 | 21.4 | 48,915,000 | 71.6 | 2,295,860 | 3.4 | 220,498 | .3 | 68,323,281 |
| Indiana | 687,524 | 3.2 | 5,342,727 | 24.9 | 12,845,838 | 59.8 | 2,511,189 | 11.7 | 92,935 | .4 | 21,480,213 |
| Iowa | 999,524 | 18.3 | 3,269,790 | 59.8 | 1,011,472 | 18.5 | 400 |  | 187,264 | 3.4 | 5,468,450 |
| Kansas | 273,652 | 6.5 | 3,020,460 | 71.1 | 97,727 | 2.3 | 795,074 | 18.7 | 60,820 | 1.4 | 4,247,733 |
| Kentucky | 1,600,472 | 3.5 | 2,808,298 | 6.2 | 39,359,428 | 87.2 | 1,300,855 | 2.9 | 78,151 | .2 | 45,147,204 |
| Maryland | 1,553,559 | 72.8 | 35,745 | 1.7 | 543,509 | 25.5 |  |  | 890 |  | 2,133,703 |
| Michigan |  |  | 39,687 | 4.8 | 791,333 | 95.2 |  |  |  |  | 831,020 |
| Missouri | 384,108 | 15.5 | 357,955 | 14.4 | 730,280 | 29.4 | 979,700 | 39.5 | 28,837 | 1.2 | 2,480,880 |
| Montana | 572,469 | 19.7 | 622,306 | 21.4 | 1,499,572 | 51.6 | 193,372 | 6.7 | 17,646 | .6 | 2,905,365 |
| New Mexico | 935,493 | 33.6 | 872,136 | 31.3 | 967,343 | 34.7 |  |  | 11,091 | .4 | 2,786,063 |
| North Carolina | 29,094 | 51.0 | 28,000 | 49.0 |  |  |  |  |  |  | 57,094 |
| North Dakota | 40,196 | 3.3 | 275,802 | 23.0 | 375,702 | 31.3 | 434,184 | 36.2 | 74,643 | 6.2 | 1,200,527 |
| Ohio | 549,751 | 1.8 | 431,526 | 1.4 | 26,321,897 | 86.4 | 2,866,683 | 9.4 | 303,150 | 1.0 | 30,473,007 |
| Oklahoma | 13,808 | .6 | 643,339 | 27.6 | 1,359,959 | 58.4 | 312,109 | 13.4 | 400 |  | 2,329,615 |
| Pennsylvania | 41,253,204 | 31.6 | 3,150,343 | 2.4 | 84,608,265 | 64.8 | 902,818 | .7 | 719,143 | .5 | 130,633,773 |
| South Dakota |  |  |  |  |  |  |  |  | 12,043 | 100.0 | 12,043 |
| Tennessee | 594,451 | 13.1 | 1,851,315 | 40.6 | 2,092,453 | 45.9 |  |  | 18,336 | .4 | 4,556,555 |
| Texas | 594,011 | 51.8 | 334,049 | 29.1 | 107,834 | 9.4 | 111,117 | 9.7 |  |  | 1,147,011 |
| Utah | 730,401 | 16.3 | *399,194 | 8.9 | 3,358,474 | 74.8 |  |  | 88 |  | 4,488,157 |
| Virginia | 224,245 | 2.1 | 1,923,891 | 18.0 | 8,518,845 | 79.7 |  |  | 26,483 | .2 | 10,693,464 |
| Washington | 1,404,523 | 52.9 | 972,129 | 36.7 | 277,015 | 10.4 |  |  |  |  | 2,653,667 |
| West Virginia | 16,123,438 | 15.9 | 1,863,700 | 1.8 | 83,373,480 | 82.0 | 244,448 | .2 | 57,831 | .1 | 101,662,897 |
| Wyoming | 737,107 | 10.9 | 2,300,932 | 34.0 | 3,719,429 | 55.1 |  |  |  |  | 6,757,468 |
| Other States | 4,000 | 23.6 | 4,878 | 28.8 | 6,750 | 39.8 | 100 | .6 | 1,225 | 7.2 | 16,953 |
|  | 78,671,195 | 16.3 | 53,050,087 | 11.0 | 336,271,335 | 69.5 | 13,606,954 | 2.8 | 2,086,967 | .4 | 483,686,538 |

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*Includes 342,509 tons reported by the companies as "pillar coal," the method of mining which, of course, differs materially from solid shooting in rooms or entries. Indeed, most of the coal reported as shot off the solid in Utah is probably "pillar coal."

*Bituminous coal mined by different methods, by States, 1924 and 1925*—(Continued)

| State | Mined by hand |  | Shot off the solid |  | Cut by machines |  | From strip pits |  | Not specified |  | Total production (net tons) |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Net tons | Percent-age | Net tons | Percent age | Net tons | Percent-age | Net tons | Percent-age | Net tons | Percent-age |  |
| 1925 |  |  |  |  |  |  |  |  |  |  |  |
| Alabama | 2,432,110 | 12.1 | 6,559,783 | 32.8 | 10,594,391 | 53.0 | 403,682 | 2.0 | 14,429 | 0.1 | 20,004,395 |
| Alaska | 8,286 | 10.0 | 74,582 | 90.0 |  |  |  |  |  |  | 82,868 |
| Arkansas | 8,958 | .7 | 472,814 | 38.8 | 537,295 | 44.0 | 199,092 | 16.3 | 1,880 | .2 | 1,220,039 |
| Colorado | 3,835,049 | 37.2 | 933,178 | 9.1 | 5,437,991 | 52.7 |  |  | 104,333 | 1.0 | 10,310,551 |
| Georgia |  |  | 6,600 | 10.0 |  |  | 59,574 | 90.0 |  |  | 66,174 |
| Illinois | 2,572,518 | 3.8 | 12,161,107 | 18.2 | 48,572,292 | 72.6 | 3,398,159 | 5.1 | 205,283 | .3 | 66,909,359 |
| Indiana | 391,726 | 1.8 | 4,577,590 | 21.6 | 12,925,739 | 60.9 | 3,269,386 | 15.4 | 60,525 | .3 | 21,224,966 |
| Iowa | 901,839 | 19.1 | 2,780,633 | 59.0 | 922,405 | 19.6 | 229 |  | 109,737 | 2.3 | 4,714,843 |
| Kansas | 232,147 | 5.1 | 2,811,530 | 62.2 | 198,099 | 4.4 | 1,123,950 | 24.8 | 158,525 | 3.5 | 4,524,251 |
| Kentucky | 1,139,048 | 2.1 | 3,950,584 | 7.1 | 48,553,752 | 88.2 | 1,375,744 | 2.5 | 49,542 | .1 | 55,068,670 |
| Maryland | 1,772,628 | 65.8 | 73,699 | 2.7 | 830,730 | 30.8 |  |  | 17,515 | .7 | 2,694,572 |
| Michigan |  |  | 24,488 | 3.0 | 783,745 | 97.0 |  |  |  |  | 808,233 |
| Missouri | 322,215 | 12.0 | 136,180 | 5.0 | 912,004 | 33.9 | 1,202,201 | 44.6 | 121,615 | 4.5 | 2,694,215 |
| Montana | 264,407 | 8.7 | 565,187 | 18.6 | 1,555,461 | 51.1 | 641,730 | 21.0 | 16,901 | .6 | 3,043,686 |
| New Mexico | 995,255 | 38.9 | 656,420 | 25.7 | 895,886 | 35.0 |  |  | 9,290 | .4 | 2,556,851 |
| North Carolina | 47,685 | 73.2 | 16,468 | 25.3 | 1,000 | 1.5 |  |  |  |  | 65,153 |
| North Dakota | 9,614 | .7 | 259,837 | 19.6 | 440,477 | 33.3 | 506,393 | 38.2 | 108,299 | 8.2 | 1,324,620 |
| Ohio | 596,056 | 2.1 | 404,022 | 1.4 | 23,655,819 | 84.4 | 3,059,324 | 10.9 | 318,891 | 1.2 | 28,034,112 |
| Oklahoma | 34,244 | 1.5 | 554,924 | 23.9 | 1,326,976 | 57.0 | 395,496 | 17.0 | 14,200 | .6 | 2,325,840 |
| Pennsylvania | 43,720,883 | 31.9 | 4,593,373 | 3.4 | 86,973,404 | 63.5 | 800,615 | .6 | 839,744 | .6 | 136,928,019 |
| South Dakota |  |  |  |  |  |  |  |  | 14,447 | 100.0 | 14,447 |
| Tennessee | 781,852 | 14.3 | 2,109,114 | 38.7 | 2,553,838 | 46.8 |  |  | 9,207 | .2 | 5,454,011 |
| Texas | 531,755 | 52.7 | 211,202 | 20.9 | 135,772 | 13.5 | 129,646 | 12.9 |  |  | 1,008,375 |
| Utah | 528,935 | 11.3 | **683,966 | 14.6 | 3,477,441 | 74.1 |  |  |  |  | 4,690,342 |
| Virginia | 319,611 | 2.5 | 2,006,309 | 15.7 | 10,472,410 | 81.8 |  |  | 1,113 |  | 12,799,443 |
| Washington | 1,417,723 | 55.9 | 965,037 | 38.0 | 138,752 | 5.5 |  |  | 16,378 | .6 | 2,537,890 |
| West Virginia | 17,471,370 | 14.3 | 3,821,151 | 3.1 | 100,786,542 | 82.4 | 272,082 | .2 | 29,814 |  | 122,380,959 |
| Wyoming | 794,612 | 12.1 | 1,676,618 | 25.6 | 4,043,537 | 61.7 | 33,579 | .5 | 4,886 | .1 | 6,553,232 |
| Other States | 7,500 | 59.4 | 5,100 | 40.4 |  |  | 25 | .2 |  |  | 12,625 |
|  | 81,138,026 | 15.6 | 53,091,496 | 10.2 | 366,725,758 | 70.6 | 16,870,907 | 3.2 | 2,226,554 | .4 | 520,052,741 |

**Includes 604,310 tons reported by the companies as "pillar coal," the method of mining which, of course, differs materially from solid shooting in rooms or entries. Indeed, most of the coal reported as shot off the solid in Utah is probably "pillar coal."

## UNDERCUTTING MACHINES

*Number of coal-cutting machines in bituminous coal mines, average output per machine, and per cent of total product mined by machines, by States, 1913 and 1923-1925*

| State | Number of coal-cutting machines in use | | | | Average output per machine net tons) | | | | Percentage of total product cut by machines | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1913 | 1923 | 1924 | 1925 | 1913 | 1923 | 1924 | 1925 | 1913 | 1923 | 1924 | 1925 |
| Alabama | 377 | 395 | 426 | 422 | 10,940 | 22,067 | 22,780 | 25,105 | 23.3 | 42.6 | 50.7 | 53.0 |
| Arkansas | 27 | 40 | 59 | 87 | 9,300 | 4,769 | 6,062 | 6,176 | 11.2 | 14.6 | 24.6 | 44.0 |
| Colorado | 300 | 440 | 404 | 404 | 7,705 | 11,129 | 13,188 | 13,460 | 25.0 | 47.3 | 51.0 | 52.7 |
| Illinois | 1,845 | 3,151 | 2,923 | 2,551 | 17,686 | 17,191 | 16,735 | 19,040 | 53.0 | 68.3 | 71.6 | 72.6 |
| Indiana | 732 | 852 | 760 | 688 | 13,302 | 16,107 | 16,902 | 18,787 | 56.7 | 54.3 | 59.8 | 60.9 |
| Iowa | 28 | 81 | 68 | 67 | 4,311 | 14,584 | 14,875 | 13,767 | 1.6 | 20.7 | 18.5 | 19.6 |
| Kansas | 9 | 22 | 26 | 32 | 2,458 | 4,452 | 3,759 | 6,191 | .3 | 2.2 | 2.3 | 4.4 |
| Kentucky | 1,263 | 1,928 | 1,910 | 1,926 | 11,365 | 19,559 | 20,607 | 25,210 | 73.2 | 84.2 | 87.2 | 88.2 |
| Maryland | 13 | 47 | 43 | 51 | 6,384 | 12,398 | 12,640 | 16,289 | 1.7 | 25.5 | 25.5 | 30.8 |
| Michigan | 130 | 80 | 64 | 63 | 6,636 | 13,579 | 12,365 | 12,440 | 70.0 | 92.7 | 95.2 | 97.0 |
| Missouri | 104 | 135 | 113 | 98 | 8,307 | 7,450 | 6,463 | 9,306 | 20.0 | 29.6 | 29.4 | 33.9 |
| Montana | 97 | 95 | 94 | 81 | 11,099 | 15,746 | 15,953 | 19,203 | 33.2 | 47.5 | 51.6 | 51.1 |
| New Mexico | 44 | 107 | 109 | 87 | 11,297 | 7,960 | 8,875 | 10,298 | 13.4 | 29.2 | 34.7 | 35.0 |
| North Carolina | -------- | 1 | ------ | 1 | ...... | 5,000 | ---- -- | 1,000 | -------- | 13.9 | -------- | 1.5 |
| North Dakota | 13 | 25 | 23 | 25 | 17,094 | 17,040 | 16,335 | 17,619 | 44.9 | 30.8 | 31.3 | 33.3 |
| Ohio | 1,681 | 2,351 | 1,906 | 1,467 | 19,418 | 15,260 | 13,810 | 16,125 | 90.2 | 88.5 | 86.4 | 84.4 |
| Oklahoma | 103 | 183 | 187 | 168 | 6,511 | 8,943 | 7,273 | 7,899 | 16.1 | 56.7 | 58.4 | 57.0 |
| Pennsylvania | 6,301 | 6,481 | 5,377 | 5,088 | 14,678 | 17,020 | 15,735 | 17,094 | 53.2 | 64.1 | 64.8 | 63.5 |
| Tennessee | 252 | 171 | 146 | 150 | 7,312 | 11,692 | 14,332 | 17,026 | 26.7 | 33.1 | 45.9 | 46.8 |
| Texas | 24 | 5 | 8 | 8 | 4,204 | 8,904 | 13,479 | 16,972 | 4.2 | 3.8 | 9.4 | 13.5 |
| Utah | 50 | 192 | 191 | 203 | 12,510 | 16,778 | 17,492 | 17,130 | 19.2 | 68.3 | 74.8 | 74.1 |
| Virginia | 187 | 277 | 282 | 280 | 22,497 | 31,210 | 29,174 | 37,401 | 47.6 | 73.5 | 79.7 | 81.8 |
| Washington | 63 | 26 | 20 | 14 | 4,453 | 9,726 | 13,851 | 9,911 | 7.2 | 8.6 | 10.4 | 5.5 |
| West Virginia | 2,539 | 3,936 | 3,312 | 3,381 | 15,500 | 21,592 | 25,173 | 29,810 | 55.3 | 78.7 | 82.0 | 82.4 |
| Wyoming | 195 | 208 | 208 | 209 | 15,645 | 18,237 | 17,882 | 19,347 | 41.3 | 50.1 | 55.1 | 61.7 |
| Other States | 2 | -------- | 1 | -------- | 600 | -------- | 6,750 | -------- | 4.8 | -------- | 39.8 | -------- |
| | 16,379 | 21,229 | 18,660 | 17,551 | 14,801 | 17,779 | 18,021 | 20,895 | 50.7 | 66.9 | 69.5 | 70.6 |

## *Summary of stripping operations that produced bituminous coal in 1925*

(For mines that recover coal both by stripping and by underground operations the returns do not permit separating men engaged in stripping from those engaged in other work. For this reason the figures of men employed represent all persons working at these mines, including those underground. The total tons produced by both methods at these same mines are also shown.)

| State and County | Number of strip pits | Number of shovels | Coal produced (net tons | | Total value at same mines | Average value per ton | Men employed | | | | Days worked | Per cent of county or State total that was mined by stripping |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Underground | | | | | |
| | | | Mined by stripping | Total at same mines | | | Miners, loaders, and shot firers | All others* | Surface | Total | | |
| Alabama: Bibb and Walker | 11 | 19 | 403.682 | 732.682 | $1.460.000 | $1.99 | 306 | 117 | 415 | 838 | 215 | **5.7 |
| Arkansas: | | | | | | | | | | | | |
| Franklin | 5 | 9 | 126,414 | 126,414 | 381,000 | 3.01 | ------- | ------- | 227 | 227 | 112 | 66.2 |
| Johnson | 3 | 6 | 72,678 | 72,678 | 315,000 | 4.33 | | | 120 | 120 | 95 | 22.8 |
| State total | 8 | 15 | 199,092 | 199,092 | 696,000 | 3.50 | | | 347 | 347 | 106 | 16.3 |
| Georgia: Walker | 1 | 3 | 59,574 | 66,174 | 220,000 | 3.32 | 48 | 19 | 70 | 137 | 220 | 90.0 |
| Illinois: | | | | | | | | | | | | |
| Fulton, Jackson, Perry, St. Clair, and Saline | 7 | 21 | 1,897,183 | 1,897,183 | 3,210,000 | 1.69 | ------- | ------- | 491 | 491 | 215 | 14.7 |
| Vermilion | 8 | 15 | 931,217 | 1,002,325 | 1,902,000 | 1.90 | 60 | 13 | 412 | 485 | 198 | 27.2 |
| Williamson | 4 | 10 | 569,759 | 569,759 | 907,000 | 1.59 | - - | - - | 134 | 134 | 208 | 6.9 |
| State total | 19 | 46 | 3,398,159 | 3,469,267 | 6,019,000 | 1.73 | 60 | 13 | 1.037 | 1.110 | 207 | 5.1 |
| Indiana: | | | | | | | | | | | | |
| Clay | 5 | 12 | 470,802 | 470,802 | 827,000 | 1.76 | ------- | ------- | 294 | 294 | 146 | 48.3 |
| Greene | 3 | 6 | 231,588 | 231,588 | 325,000 | 1.40 | ------- | ------- | 137 | 137 | 111 | 18.2 |
| Owen, Sullivan, and Vigo | 6 | 12 | 459,725 | 459,725 | 861,000 | 1.87 | ------- | ------- | 261 | 261 | 158 | 4.9 |
| Pike | 4 | 18 | 1,576,508 | 1,576,508 | 2,707,000 | 1.72 | ------- | ------- | 565 | 565 | 245 | 73.8 |
| Warrick | 4 | 9 | 530,763 | 530,763 | 904,000 | 1.70 | - - | - - | 283 | 283 | 146 | 59.5 |
| State total | 22 | 57 | 3,269,386 | 3,269,386 | 5,624,000 | 1.72 | | | 1.540 | 1.540 | 181 | 15.4 |
| Kansas: | | | | | | | | | | | | |
| Bourbon | 1 | ------- | 2,200 | 2,200 | 6,000 | 2.73 | ------- | ------- | 9 | 9 | 44 | 17.6 |
| Cherokee | 15 | 16 | 722,422 | 722,422 | 1,767,000 | 2.45 | ------- | ------- | 321 | 321 | 146 | 61.4 |
| Crawford | 22 | 17 | 399,328 | 399,328 | 1,053,000 | 2.64 | | | 380 | 380 | 141 | 12.8 |
| State total | 38 | 33 | 1,123.950 | 1,123,950 | 2,826,000 | 2.51 | | | 710 | 710 | 142 | 24.8 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kentucky: | | | | | | | | | | | | |
| Hopkins | 8 | 22 | 1,096,741 | 1,115,741 | 1,559,000 | 1.40 | 25 | 10 | 579 | 614 | 191 | 28.0 |
| Muhlenberg and Ohio | 3 | 7 | 279,003 | 279,003 | 367,000 | 1.32 | — | — | 240 | 240 | 133 | 6.0 |
| State total | 11 | 29 | 1,375,744 | 1,394,744 | 1,926,000 | 1.38 | 25 | 10 | 819 | 854 | 175 | 2.5 |
| Missouri: | | | | | | | | | | | | |
| Barton | 13 | 17 | 906,191 | 906,191 | 2,543,000 | 2.81 | — | — | 555 | 555 | 156 | 95.6 |
| Bates | 4 | 6 | 188,511 | 188,511 | 391,000 | 2.07 | — | — | 120 | 120 | 202 | 71.5 |
| Henry, St. Clair, and Vernon | 4 | 4 | 107,499 | 107,499 | 285,000 | 2.65 | — | — | 107 | 107 | 194 | 91.5 |
| State total | 21 | 27 | 1,202,201 | 1,202,201 | 3,219,000 | 2.68 | — | — | 782 | 782 | 168 | 44.6 |
| North Dakota: | | | | | | | | | | | | |
| Bowman, Divide, Hettinger, McLean, cer, and Ward | 7 | 5 | 174,675 | 176,317 | 289,000 | 1.64 | 3 | 2 | 103 | 108 | 151 | 31.9 |
| Burke | 8 | 6 | 331,718 | 331,718 | 622,000 | 1.88 | — | — | 166 | 166 | 145 | 100.0 |
| State total | 15 | 11 | 506,393 | 508,035 | 911,000 | 1.79 | 3 | 2 | 269 | 274 | 148 | 38.2 |
| Ohio: | | | | | | | | | | | | |
| Carroll, Columbiana, and Hocking | 4 | 6 | 92,663 | 107,514 | 235,000 | 2.19 | 10 | 4 | 45 | 59 | 182 | 6.1 |
| Harrison | 15 | 32 | 1,956,214 | 1,956,214 | 2,789,000 | 1.43 | — | — | 744 | 744 | 196 | 69.2 |
| Jefferson | 6 | 20 | 704,121 | 709,775 | 1,188,000 | 1.67 | 25 | 6 | 349 | 380 | 186 | 13.6 |
| Muskingum | 3 | 3 | 57,055 | 57,055 | 92,000 | 1.61 | — | — | 102 | 102 | 288 | 18.9 |
| Perry | 4 | 12 | 133,004 | 133,004 | 226,000 | 1.70 | — | — | 191 | 191 | 91 | 8.4 |
| Tuscarawas | 5 | 5 | 116,267 | 127,604 | 259,000 | 2.03 | 12 | 3 | 47 | 62 | 205 | 9.0 |
| State total | 37 | 78 | 3,059,324 | 3,091,166 | 4,789,000 | 1.55 | 47 | 13 | 1,478 | 1,538 | 169 | 10.9 |
| Oklahoma: | | | | | | | | | | | | |
| Haskell | 3 | 3 | 81,288 | 129,132 | 397,000 | 3.07 | 19 | 10 | 136 | 165 | 280 | 62.9 |
| Le Flore, Muskogee, and Wagoner | 3 | 9 | 134,273 | 134,273 | 420,000 | 3.13 | — | — | 148 | 148 | 169 | 37.1 |
| Tulsa | 3 | 5 | 179,935 | 179,935 | 583,000 | 3.24 | — | — | 155 | 155 | 258 | 87.5 |
| State total | 9 | 17 | 395,496 | 443,340 | 1,400,000 | 3.16 | 19 | 10 | 439 | 468 | 238 | 17.0 |
| Pennsylvania: | | | | | | | | | | | | |
| Allegheny | 4 | 7 | 176,504 | 205,158 | 408,000 | 1.99 | 34 | 6 | 102 | 142 | 200 | 1.5 |
| Center, Clarion, Clinton, Jefferson, and Somerset | 7 | 9 | 103,251 | 111,893 | 212,000 | 1.89 | 31 | 7 | 112 | 150 | 83 | .7 |
| Clearfield | 4 | 6 | 5,351 | 10,213 | 18,000 | 1.76 | 45 | 4 | 19 | 68 | 34 | .1 |
| Washington | 3 | 8 | 231,332 | 231,332 | 358,000 | 1.55 | — | — | 120 | 120 | 243 | 1.5 |
| Westmoreland | 7 | 9 | 284,177 | 656,100 | 1,053,000 | 1.60 | 219 | 24 | 182 | 425 | 250 | 1.4 |
| State total | 25 | 39 | 800,615 | 1,214,705 | 2,049,000 | 1.69 | 329 | 41 | 535 | 905 | 197 | .6 |
| West Virginia: Harrison and Taylor | 5 | 8 | 272,082 | 273,375 | 332,000 | 1.21 | 7 | 3 | 102 | 112 | 192 | **3.7 |
| Other States*** | 5 | 7 | 805,209 | 805,209 | 1,139,000 | 1.41 | | | 126 | 126 | 216 | **71.8 |
| Grand total | 227 | 389 | 16,870,907 | 17,793,326 | 32,610,000 | 1.83 | 844 | 28 | 8,669 | 9,741 | 182 | 3.2 |

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*Includes haulage and track men.

**Per cent of county totals, not State.

***California, Iowa, Montana, Texas, and Wyoming.

## UNDERGROUND LOADING MACHINES

The great interest in mechanical loading has led the Bureau of Mines to make a study of the number of loading machines in bituminous coal mines. The figures obtained were published in Weekly Coal Report No. 489, and the following discussion is abstracted from an article, by members of the bureau, that was published in Coal Age.*

The quantity of bituminous coal loaded underground by machine jumped from 1,879,000 tons in 1923 to 6,243,000 tons in 1925, and a further large increase seems assured for 1926. The remarkable growth of machine loading may be seen from a comparison with machine cutting or with stripping. More bituminous coal is now loaded by machine in the United States than was cut by machine in 1890 or than was won by stripping as late as 1917.

The six and a quarter million tons machine loaded in 1925 were handled by 340 machines installed in 95 mines. Fourteen other mines had 42 additional machines, but did not report the tonnage loaded by them. As most of this group were experimental installations, they loaded only small amounts of coal mechanically. Details are given in Table 55.

The study brings to completion an inquiry begun through the United States Geological Survey in 1921. For the years before 1923 the results obtained did not permit statistical tabulation. It is clear, however, that the number of machines in use and the tonnage loaded were much less than in 1923. For statistical purposes the commercial use of the loader may be said to begin in 1923.

The method of gathering information has been as follows: Every known manufacturer of loading equipment was asked to furnish a list of the mining companies that had bought or installed machines. The companies thus indicated were then asked to supply information as to the number of machines in use, the mines where they have been installed, the dates of installation, and the tonnages of coal loaded by them. In addition to the list of users furnished by machine manufacturers and the operation and production data furnished by mine operators, a further check against omissions was made by an inquiry in the annual statistical questionnaire sent to all mine operators. Thus, two sources of information have been used. The bureau takes this occasion to acknowledge gratefully the assistance given by the many companies which have furnished data.

For the purpose of this study a loading machine has been defined as one that gathers coal at the face in an underground mine and loads it mechanically onto either mine cars or conveyors. Drag scrapers have been included when hand loading was eliminated. Belt or shaking conveyors, whether at the face or elsewhere, have not been counted, unless the act of loading onto the conveyor was performed mechanically, the purpose of the study being to determine the degree of substitution of machine work for hand shoveling. Difficulty was experienced in classifying elevating conveyors, such as the Jeffrey pit-car loader and one or two other types, which require some hand work to get the coal onto the conveyor but which nevertheless eliminate most of the labor of lifting from floor to mine car. Because of this potential economy in hand shoveling it was decided to include such machines in the figures although, of course, they represent a less complete mechanization than do loading machines proper. Pit-car loaders have been most used in Illinois and account for a large part of the 1,293,929 tons of machine-loaded coal reported from that State. Surface stripping operations, which are covered elsewhere in the bureau's statistical reports (see Table 54), are not included. No attempt has been made to compare the number and performance of different makes or types of machines. Similarly, machines belonging to the manufacturer and temporarily installed for demonstration or experiment have not been counted.

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*Kenny, Raymond, and Tryon, F. G., "Machine loading gains rapidly in last three years": Coal Age, vol. 30, Dec. 16, 1926, pp. 847-848.

The columns of the table under the heading "Other mines reporting machines but not tonnage loaded," include two types of report—first, cases that were clearly reported as experimentals, and, second, cases where the operators did not report the tons loaded but did state the number of machines in use. In a great majority of the latter cases the operators when questioned further stated that the use of machines was still in an experimental stage, and that they were not ready to report tonnage figures. It may be assumed, therefore, that practically all of the 42 machines used in 1925 for which no tonnages were reported were employed experimentally, and the same would apply to the 60 machines so reported in 1924 and the 16 in 1923.

In considering the rate at which mechanical loading can be introduced the early experience with machine cutting is of interest. Seventy-one per cent of the soft coal mined in 1925 was cut by machine, but this large percentage was the result of 45 years of sales effort and adaptation, to say nothing of many years of preliminary experiment before a workable machine could be devised. The machine cutter was invented in England and began to be manufactured for sale in the United States about 1880. Prior to 1888 a total of approximately 735 machines had been sold by American manufacturers, many of which were doubtless soon discarded (E. W. Parker, Coal in 1897, Mineral Resources, Part II, p. 324). The first statistical survey of cutting machines covered the year 1891 and found 545 machines in use with which 6,211,732 tons were mined. As the total product for that year was 117,900,000 tons, it will be seen that in the 11 years from 1880 to 1891 machine cutting had been extended to 5.3 per cent of the output. The sale of coal-loading machines, on the other hand, has been actively pushed for barely five years, and in this time the tonnage loaded by machine has come to equal that cut mechanically after 11 years of active effort, though because the output of today is so much larger the proportion loaded by machine is still only 1.2 per cent of the total. From 1923 to 1925 the increase in machine loading amounted to 232 per cent.

In 1925 the leading States in the order of their production of coal by machine loaders were: West Virginia (including Tazewell County, Va.), Illinois, Indiana, Wyoming, Pennsylvania, and Virginia (except Tazewell County). The total production figures of these States and the per cent of coal that was machine loaded are as shown in Table 56.

*Loading machines used underground in bituminous coal mines, by States, 1923-1925*

(Includes elevating conveyors of type of the Jeffrey pit-car loader and one or two others)

| State | 1923 | | | | | 1924 | | | | | 1925 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of mines | Number of machines | Net tons loaded by machines | Other mines reporting machines but not tonnage loaded* | | Number of mines | Number of machines | Net tons loaded by machines | Other mines reporting machines but not tonnage loaded* | | Number of mines | Number of machines | Net tons loaded by machines | Other mines reporting machines but not tonnage loaded* | |
| | | | | Mines | Machines | | | | Mines | Machines | | | | Mines | Machines |
| Alabama | 3 | ** | ** | — | — | 3 | ** | ** | 4 | 9 | 2 | ** | ** | 2 | ** |
| Arkansas | — | — | — | — | — | — | — | — | 1 | ** | 1 | ** | ** | — | — |
| Colorado | 2 | ** | ** | — | — | 3 | ** | ** | 1 | ** | 2 | ** | ** | — | — |
| Illinois | 4 | 18 | 77,542 | — | — | 4 | 28 | 259,584 | 3 | ** | 16 | 102 | 1,293,929 | 4 | 12 |
| Indiana | | | | | | 8 | 37 | 325,117 | 4 | 9 | 10 | 62 | 1,030,490 | 2 | ** |
| Iowa | — | — | — | — | — | 1 | ** | ** | — | — | 3 | 5 | 18,200 | — | — |
| Kansas | — | — | — | — | — | 1 | ** | ** | — | — | — | — | — | — | — |
| Kentucky | 5 | 8 | 34,015 | 7 | 10 | 6 | 15 | 96,077 | 2 | ** | 6 | 11 | 157,862 | 1 | ** |
| Maryland | 2 | ** | ** | — | — | 2 | ** | ** | — | — | 1 | ** | ** | — | — |
| Michigan | — | — | — | — | — | — | — | — | — | — | 2 | ** | ** | — | — |
| Ohio | — | — | — | 1 | ** | 3 | 10 | 47,357 | 1 | ** | 2 | ** | ** | — | — |
| Oklahoma | — | — | — | — | — | 1 | ** | ** | 2 | ** | — | — | — | — | — |
| Pennsylvania | 5 | 9 | 52,014 | 1 | ** | 11 | 20 | 153,287 | 1 | ** | 14 | 34 | 233,023 | 1 | ** |
| Tennessee | — | — | — | — | — | 1 | ** | ** | 1 | ** | 1 | ** | ** | — | — |
| Virginia*** | 3 | 7 | 40,939 | — | — | 5 | 11 | 141,351 | — | — | 4 | 7 | 224,032 | — | — |
| West Virginia**** | 33 | 54 | 1,367,688 | 4 | 4 | 32 | 67 | 2,012,790 | 12 | 17 | 26 | 58 | 2,480,768 | 4 | 8 |
| Wyoming | 2 | ** | ** | — | — | 2 | ** | ** | — | — | 5 | 30 | 579,272 | — | — |
| Undistributed | | 29 | 307,528 | | 2 | | 31 | 459,959 | | 25 | — | 31 | 225,528 | | 22 |
| | 60 | 125 | 1,879,726 | 13 | 16 | 83 | 219 | 3,495,522 | 32 | 60 | 95 | 340 | 6,243,104 | 14 | 42 |

## NUMBER AND SIZE OF MINES

As already pointed out, no statistics of the production of wagon mines were collected in 1925. It was known that most of the wagon mines working in 1922 and 1923 had closed in the latter part of 1923, and in 1924 and 1925 the market conditions were so unfavorable that the production of the few wagon mines which may have been operating must have been extremely small. Those who wish detailed statistics of the number, location, and output of wagon mines will find them in the report for 1923 (Mineral Resources, Part II, pp. 591-606).

The following tables deal exclusively with the commercial mines—that term including, as already explained, many small properties producing as little as 1,000 tons but operating fairly steadily year after year.

For convenience in studying production by size of mines the mines are divided into five classes. Class 1 includes mines that produce each year more than 200,000 tons; class 2, those that produce less than 200,000 and more than 100,000 tons; class 3, those that produce less than 100,000 and more than 50,000 tons; class 4, those that produce less than 50,000 and more than 10,000 tons; and class 5, those that produce less than 10,000 tons. As this classification is made according to performance, not according to capacity, the number of mines in a given class is not constant from year to year. In 1920, for example, 701 mines were listed in class 1; in 1921, 482; in 1922, 416; in 1923, 748; in 1924, 646; and in 1925, 714. These fluctuations do not indicate a corresponding change from year to year in the number of mines having the acre age and the development that would enable them to produce annually 200,000 tons or more, but they do indicate that in a given year only the number of mines listed in class 1 were able to produce more than 200,000 tons.

# *Number and production of commercial bituminous coal mines, by size classes, in 1924**

(No canvass of wagon mines was made)

| State | Class 1A (more than 500,000 tons) | | | | | Class 1B (200,000 to 500,000 tons) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mines | | Production | | | Mines | | Production | | |
| | Number | Percentage | Total (net tons) | Average pe mine (net tons) | Percentage | Number | Percentage | Total (net tons) | Average pe mine (net tons) | Percentage |
| Alabama | 4 | 1.7 | 3,164,081 | 791,020 | 16.5 | 17 | 7.2 | 5,050,160 | 297,068 | 26.4 |
| Alaska | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| California, Idaho, Nebraska, and Oregon | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Colorado | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Georgia | ----- | ----- | ----- | ----- | ----- | 15 | 6.5 | 3,860,126 | 257,342 | 37.0 |
| Illinois | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Indiana | 46 | 9.4 | 34,357,009 | 746,891 | 50.3 | 60 | 12.3 | 18,690,508 | 311,508 | 27.4 |
| Iowa | 3 | 1.2 | 1,911,657 | 637,219 | 8.9 | 34 | 13.7 | 10,078,878 | 296,438 | 46.9 |
| Kansas | ----- | ----- | ----- | ----- | ----- | 4 | 1.6 | 1,225,672 | 306,418 | 22.4 |
| Kentucky: | | | | | | | | | | |
| Eastern | ----- | ----- | ----- | ----- | ----- | 2 | .9 | 460,152 | 230,076 | 10.8 |
| Western | 4 | .8 | 3,337,816 | 834,454 | 9.2 | 42 | 8.5 | 10,440,018 | 248,572 | 28.9 |
| Maryland | ----- | ----- | ----- | ----- | ----- | 8 | 4.9 | 2,053,810 | 256,726 | 22.8 |
| Michigan | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Missouri | ----- | ----- | ----- | ----- | ----- | 2 | 22.2 | 479,036 | 239,518 | 57.6 |
| Montana | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| New Mexico | 2 | 2.9 | 1,253,784 | 626,892 | 43.2 | 1 | 1.5 | 202,167 | 202,167 | 7.0 |
| North Carolina | 1 | 2.4 | 500,061 | 500,061 | 17.9 | 1 | 2.4 | 241,507 | 241,507 | 8.7 |
| North Dakota | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Ohio | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Oklahoma | 3 | .4 | 1,614,613 | 538,204 | 5.3 | 40 | 5.3 | 11,560,254 | 289,006 | 37.9 |
| Pennsylvania | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| South Dakota | 47 | 2.2 | 31,184,295 | 663,496 | 23.9 | 134 | 6.3 | 39,466,552 | 294,526 | 30.2 |
| Tennessee | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Texas | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Utah | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Virginia | ----- | ----- | ----- | ----- | ----- | 8 | 20.5 | 2,383,637 | 297,955 | 53.1 |
| Washington | 4 | 3.5 | 2,692,815 | 673,203 | 25.2 | 18 | 15.7 | 4,711,967 | 261,776 | 44.1 |
| West Virginia | ----- | ----- | ----- | ----- | ----- | 5 | 8.6 | 1,273,623 | 254,724 | 48.0 |
| Wyoming | 15 | 1.2 | 8,551,308 | 570,087 | 8.4 | 117 | 9.6 | 33,990,720 | 290,519 | 33.4 |
| | ----- | ----- | ----- | ----- | ----- | 9 | 14.5 | 2,601,237 | 289,026 | 38.5 |
| | 129 | 1.7 | 88,567,439 | 686,569 | 18.3 | 517 | 6.8 | 148,770,024 | 287,756 | 30.7 |

*Note that this table represents mines, not companies, for which the showing would be very different.

*Number and production of commercial bituminous coal mines, by size classes, in 1924*—(Continued)

| State | Class 2 (100,000 to 200,000 tons | | | | | Class 3 (50,000 to 100,000 tons) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mines | | Production | | | Mines | | Production | | |
| | Number | Percentage | Total (net tons) | Average pe mine (net tons) | Percentage | age | Percentag | Total (net tons) | Average p mine (net tons) | Percentage |
| Alabama | 27 | 11.3 | 3,861,196 | 143,007 | 20.2 | 49 | 20.6 | 3,882,027 | 79,225 | 20.3 |
| Alaska | ------ | ------ | ------ | ------ | ------ | 1 | 12.5 | 51,426 | 51,426 | 51.6 |
| California, Idaho, Nebraska, and Oregon | 1 | 1.2 | 122,099 | 122,099 | 8.4 | 7 | 8.1 | 452,232 | 64,605 | 31.2 |
| Colorado | 21 | 9.1 | 3,037,942 | 144,664 | 29.1 | 27 | 11.7 | 1,910,957 | 70,776 | 18.3 |
| Georgia | ------ | ------ | ------ | ------ | ------ | 1 | 50.0 | 72,947 | 72,947 | 97.3 |
| Illinois | 59 | 12.1 | 8,246,762 | 139,775 | 12.1 | 58 | 11.9 | 4,361,333 | 75,195 | 6.4 |
| Indiana | 33 | 13.3 | 4,808,610 | 148,443 | 22.8 | 39 | 15.7 | 2,816,277 | 72,212 | 13.1 |
| Iowa | 11 | 4.3 | 1,527,983 | 138,908 | 27.9 | 14 | 5.5 | 973,294 | 69,521 | 17.8 |
| Kansas | 7 | 3.1 | 901,772 | 128,825 | 21.2 | 18 | 7.9 | 1,267,966 | 70,443 | 29.9 |
| Kentucky: | | | | | | | | | | |
| Eastern | 84 | 17.0 | 11,437,954 | 136,166 | 31.7 | 92 | 18.5 | 6,750,239 | 73,372 | 18.7 |
| Western | 25 | 15.2 | 3,373,128 | 134,925 | 37.4 | 23 | 14.0 | 1,659,521 | 72,153 | 18.4 |
| Maryland | 4 | 4.3 | 501,425 | 125,356 | 23.5 | 7 | 7.5 | 456,076 | 65,154 | 21.4 |
| Michigan | 1 | 11.1 | 145,664 | 145,664 | 17.5 | 2 | 22.2 | 144,317 | 72,159 | 17.4 |
| Missouri | ------ | ------ | ------ | ------ | ------ | 17 | 13.4 | 1,213,406 | 71,377 | 48.9 |
| Montana | 5 | 7.3 | 839,724 | 167,945 | 28.9 | 4 | 5.9 | 262,662 | 65,665 | 9.0 |
| New Mexico | 11 | 26.2 | 1,437,376 | 130,670 | 51.6 | 6 | 14.3 | 401,327 | 66,888 | 14.4 |
| North Carolina | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| North Dakota | 3 | 2.3 | 410,312 | 136,771 | 34.2 | 3 | 2.3 | 200,889 | 66,963 | 16.7 |
| Ohio | 56 | 7.5 | 7,800,761 | 139,299 | 25.6 | 59 | 7.9 | 4,167,954 | 70,643 | 13.7 |
| Oklahoma | 3 | 3.2 | 365,600 | 121,867 | 15.7 | 8 | 8.5 | 537,375 | 67,172 | 23.1 |
| Pennsylvania | 196 | 9.2 | 27,239,447 | 138,977 | 20.9 | 210 | 9.9 | 15,177,822 | 72,275 | 11.6 |
| South Dakota | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Tennessee | 13 | 9.4 | 1,793,852 | 137,980 | 39.4 | 15 | 10.8 | 1,160,034 | 77,336 | 25.5 |
| Texas | 1 | 2.3 | 111,117 | 111,117 | 9.7 | 5 | 11.4 | 283,964 | 56,972 | 24.8 |
| Utah | 9 | 23.1 | 1,455,520 | 161,724 | 32.4 | 7 | 17.9 | 507,661 | 72,523 | 11.3 |
| Virginia | 6 | 5.2 | 864,469 | 144,078 | 8.1 | 20 | 17.4 | 1,453,980 | 72,699 | 13.6 |
| Washington | 5 | 8.7 | 649,222 | 129,844 | 24.5 | 6 | 10.3 | 413,483 | 68,914 | 15.6 |
| West Virginia | 216 | 17.7 | 30,971,374 | 143,386 | 30.5 | 236 | 19.3 | 16,677,689 | 70,668 | 16.4 |
| Wyoming | 22 | 35.5 | 3,224,150 | 146,552 | 47.7 | 9 | 14.5 | 709,698 | 78,855 | 10.5 |
| | 819 | 10.8 | 115,217,459 | 140,681 | 23.8 | 943 | 12.4 | 67,966,556 | 72,075 | 14.1 |

| State | Class 4 (10,000 to 50,000 tons) | | | | |
|---|---|---|---|---|---|
| | Mines | | Production | | |
| | Number | Percentage | Total (net tons) | per mine (net tons) | Percentage |
| Alabama | 90 | 37.8 | 2,951,578 | 32,795 | 15.4 |
| Alaska | 1 | 12.5 | 35,134 | 35,134 | 35.3 |
| Arkansas | 28 | 32.6 | 699,768 | 24,992 | 48.2 |
| Colorado | 47 | 20.3 | 1,339,519 | 28,500 | 12.8 |
| Illinois | 88 | 18.0 | 2,085,227 | 23,696 | 3.0 |
| Indiana | 57 | 23.0 | 1,479,728 | 25,960 | 6.9 |
| Iowa | 49 | 19.1 | 1,275,907 | 26,039 | 23.4 |
| Kansas | 48 | 21.0 | 1,078,805 | 22,475 | 25.4 |
| Kentucky: | | | | | |
| Eastern | 142 | 28.6 | 3,684,213 | 25,945 | 10.2 |
| Western | 62 | 37.8 | 1,775,992 | 28,645 | 19.7 |
| Maryland | 37 | 39.8 | 1,020,423 | 27,579 | 47.8 |
| Michigan | 3 | 33.3 | 58,503 | 19,501 | 7.1 |
| Missouri | 40 | 31.5 | 988,748 | 24,719 | 39.9 |
| Montana | 8 | 11.8 | 194,793 | 24,349 | 6.7 |
| New Mexico | 7 | 16.7 | 167,941 | 23,992 | 6.0 |
| North Carolina | 2 | 100.0 | 57,094 | 28,547 | 100.0 |
| North Dakota | 17 | 12.9 | 355,578 | 20,916 | 29.6 |
| Ohio | 172 | 22.9 | 4,021,634 | 23,382 | 13.2 |
| Oklahoma | 45 | 47.9 | 1,237,363 | 27,497 | 53.1 |
| Pennsylvania | 591 | 27.9 | 14,139,085 | 23,924 | 10.8 |
| Tennessee | 56 | 40.2 | 1,405,597 | 25,100 | 30.8 |
| Texas | 31 | 70.4 | 706,379 | 22,786 | 61.5 |
| Utah | 4 | 10.3 | 123,360 | 30,840 | 2.8 |
| Virginia | 34 | 29.5 | 847,658 | 24,931 | 7.9 |
| Washington | 12 | 20.7 | 251,091 | 20,924 | 9.5 |
| West Virginia | 369 | 30.3 | 10,428,950 | 28,263 | 10.3 |
| Wyoming | 7 | 11.3 | 195,766 | 27,966 | 2.9 |
| | 2.047 | 27.0 | 52,005,834 | 25,699 | 10.9 |

*Number and production of commercial bituminous coal mines, by size classes, in 1924*—(Continued)

| State | Class 5 (less than 10,000 tons) | | | | | Total | | |
|---|---|---|---|---|---|---|---|---|
| | Mines | | Production | | | | Production (net tons) | |
| | Number | Percentage | Total (net tons) | Average per mine (net tons) | Percentage | Mines | Total | Average per mine |
| Alabama | 51 | 21.4 | 221,142 | 4,336 | 1.2 | 238 | 19,130,184 | 80,379 |
| Alaska | 6 | 75.0 | 13,103 | 2,184 | 13.1 | 8 | 99,663 | 12,458 |
| Arkansas | 50 | 58.1 | 177,404 | 3,548 | 12.2 | 86 | 1,451,503 | 16,878 |
| California, Idaho, Nebraska, and Oregon | 9 | 100.0 | 16,953 | 1,884 | 100.0 | 9 | 16,953 | 1,884 |
| Colorado | 121 | 52.4 | 295,554 | 2,443 | 2.8 | 231 | 10,444,098 | 45,213 |
| Georgia | 1 | 50.0 | 2,000 | 2,000 | 2.7 | 2 | 74,947 | 37,474 |
| Illinois | 177 | 36.3 | 582,442 | 3,291 | .8 | 488 | 68,323,281 | 140,007 |
| Indiana | 82 | 33.1 | 295,063 | 3,598 | 1.4 | 248 | 21,480,213 | 86,614 |
| Iowa | 178 | 69.5 | 465,594 | 2,616 | 8.5 | 256 | 5,468,450 | 21,361 |
| Kansas | 153 | 67.1 | 539,038 | 3,523 | 12.7 | 228 | 4,247,733 | 18,630 |
| Kentucky: | | | | | | | | |
| Eastern | 132 | 26.6 | 476,893 | 3,613 | 1.3 | 496 | 36,127,133 | 72,837 |
| Western | 46 | 28.1 | 157,620 | 3,426 | 1.7 | 164 | 9,020,071 | 55,000 |
| Maryland | 45 | 48.4 | 155,779 | 3,462 | 7.3 | 93 | 2,133,703 | 22,943 |
| Michigan | 1 | 11.2 | 3,500 | 3,500 | .4 | 9 | 831,020 | 92,335 |
| Missouri | 70 | 55.1 | 278,726 | 3,982 | 11.2 | 127 | 2,480,880 | 19,534 |
| Montana | 48 | 70.6 | 152,235 | 3,171 | 5.2 | 68 | 2,905,365 | 42,726 |
| New Mexico | 16 | 38.0 | 37,851 | 2,366 | 1.4 | 42 | 2,786,063 | 66,335 |
| North Carolina | ---- | ---- | ---- | ---- | ---- | 2 | 57,094 | 28,547 |
| North Dakota | 109 | 82.5 | 233,748 | 2,144 | 19.5 | 132 | 1,200,527 | 9,095 |
| Ohio | 420 | 56.0 | 1,307,791 | 3,114 | 4.3 | 750 | 30,473,007 | 40,631 |
| Oklahoma | 38 | 40.4 | 189,277 | 4,981 | 8.1 | 94 | 2,329,615 | 24,783 |
| Pennsylvania | 944 | 44.5 | 3,426,572 | 3,630 | 2.6 | 2,122 | 130,633,773 | 61,502 |
| South Dakota | 16 | 100.0 | 12,043 | 753 | 100.0 | 16 | 12,043 | 753 |
| Tennessee | 55 | 39.6 | 197,072 | 3,583 | 4.3 | 139 | 4,556,555 | 32,781 |
| Texas | 7 | 15.9 | 45,551 | 6,507 | 4.0 | 44 | 1,147,011 | 26,068 |
| Utah | 11 | 28.2 | 17,979 | 1,634 | .4 | 39 | 4,488,157 | 115,081 |
| Virginia | 33 | 28.7 | 122,575 | 3,714 | 1.1 | 115 | 10,693,464 | 92,987 |
| Washington | 30 | 51.7 | 66,248 | 2,208 | 2.4 | 58 | 2,653,667 | 45,753 |
| West Virginia | 267 | 21.9 | 1,042,856 | 3,906 | 1.0 | 1,220 | 101,662,897 | 83,330 |
| Wyoming | 15 | 24.2 | 26,617 | 1,774 | .4 | 62 | 6,757,468 | 108,991 |
| | 3,131 | 41.3 | 10,559,226 | 3,372 | 2.2 | 7,586 | 483,686,538 | 63,760 |

In 1924 and 1925, for the first time, the class 1 mines were subdivided into class 1A, producing 500,000 tons or more, and class 1B, producing from 200,000 to 500,000 tons. The results are shown in the tables immediately preceding and following. In 1925 there were 145 bituminous coal mines that produced 500,000 tons or more; their total output was 108,577,269 tons, an average of 748,809 tons per mine. Although constituting but 2 per cent of the total number of mines, they contributed 20.9 per cent of the production of the country. The mines of class 1B numbered 569 and contributed 32.8 per cent of the total output.

The market changes of 1923 to 1925 tended to throw more of the available business to the larger mines, and as a result the proportion of the total output produced by them increased. In 1923, 47.2 per cent of the total production came from the class 1 mines. In 1925 this had increased to 53.7 per cent.

*Number and production of commercial bituminous coal mines, by size classes, in 1925**

*Note that this table represents mines, not companies, for which the showing would be very different. No canvass of wagon mines was made, however.

| State | Class 1A (more than 500,000 tons) | | | | | Class 1B (200,000 to 500,000 tons) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mines | | Production | | | Mines | | Production | | |
| | Number | Percentage | Total (net tons) | Average per mine (net tons) | Percentage | Number | Percentage | Total (net tons) | Average per mine (net tons) | Percentage |
| Alabama | 4 | 1.7 | 3,188,855 | 797,214 | 15.9 | 19 | 7.9 | 5,522,176 | 290,641 | 27.6 |
| Colorado | ------ | ------ | ------ | ------ | ------ | 13 | 5.7 | 3,748,389 | 288,338 | 36.4 |
| Illinois | 48 | 10.3 | 40,030,743 | 833,974 | 59.8 | 48 | 10.3 | 15,143,535 | 315,490 | 22.6 |
| Indiana | 3 | 1.5 | 2,677,560 | 892,520 | 12.6 | 33 | 16.3 | 10,642,650 | 322,505 | 50.1 |
| Iowa | ------ | ------ | ------ | ------ | ------ | 5 | 2.4 | 1,502,196 | 300,439 | 31.8 |
| Kansas | ------ | ------ | ------ | ------ | ------ | 1 | .4 | 307,281 | 307,281 | 6.8 |
| Kentucky: | | | | | | | | | | |
| Eastern | 6 | 1.2 | 4,616,900 | 769,483 | 10.8 | 49 | 10.2 | 14,283,127 | 291,492 | 33.3 |
| Western | ------ | ------ | ------ | ------ | ------ | 15 | 9.3 | 3,651,931 | 243,462 | 30.0 |
| Maryland | ------ | ------ | ------ | ------ | ------ | 3 | 3.4 | 668,114 | 222,705 | 24.8 |
| Michigan | ------ | ------ | ------ | ------ | ------ | 2 | 20.0 | 462,520 | 231,260 | 57.2 |
| Montana | 3 | 5.8 | 1,761,331 | 587,110 | 57.9 | 1 | 1.9 | 225,236 | 225,236 | 7.4 |
| New Mexico | ------ | ------ | ------ | ------ | ------ | 2 | 5.3 | 730,469 | 365,235 | 28.6 |
| Ohio | 2 | .3 | 1,321,512 | 660,756 | 4.7 | 32 | 5.0 | 10,429,508 | 325,922 | 37.3 |
| Pennsylvania | 48 | 2.4 | 35,954,239 | 749,047 | 26.3 | 132 | 6.7 | 41,989,360 | 318,101 | 30.7 |
| Tennessee | ------ | ------ | ------ | ------ | ------ | 3 | 2.7 | 781,147 | 260,382 | 14.3 |
| Utah | ------ | ------ | ------ | ------ | ------ | 10 | 24.4 | 3,119,343 | 311,934 | 66.5 |
| Virginia | 6 | 5.3 | 4,043,034 | 673,839 | 31.6 | 19 | 16.8 | 5,228,185 | 275,168 | 40.8 |
| Washington | ------ | ------ | ------ | ------ | ------ | 4 | 7.2 | 1,067,049 | 266,762 | 42.1 |
| West Virginia | 25 | 2.1 | 14,983,095 | 599,324 | 12.2 | 169 | 14.4 | 48,686,759 | 288,087 | 39.8 |
| Wyoming | ------ | ------ | ------ | ------ | ------ | 9 | 14.8 | 2,424,049 | 269,339 | 37.0 |
| | 145 | 2.0 | 108,577,269 | 748,809 | 20.9 | 569 | 8.0 | 170,613,024 | 299,847 | 32.8 |

| State | Class 2 (100,000 to 200,000 tons) | | | | | Class 3 (50,000 to 100,000 tons) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mines | | Production | | | Mines | | Production | | |
| | Number | Percentage | Total (net tons) | Average per mine (net tons) | Percentage | Number | Percentage | Total (net tons) | Average per mine (net tons) | Percentage |
| Alabama | 40 | 16.7 | 5,666,460 | 141,662 | 28.3 | 46 | 19.3 | 3,422,011 | 74,392 | 17.1 |
| Arkansas | ------ | ------ | ------------ | --------- | ------ | 2 | 2.1 | 126,523 | 63,262 | 10.4 |
| Colorado | 20 | 8.7 | 3,001,579 | 150,079 | 29.1 | 26 | 11.4 | 1,961,617 | 75,447 | 19.0 |
| Georgia | ------ | ------ | ------------ | --------- | ------ | 1 | 100.0 | 66,174 | 66,174 | 100.0 |
| Illinois | 45 | 9.7 | 6,622,226 | 147,161 | 9.9 | 33 | 7.1 | 2,536,923 | 76,876 | 3.8 |
| Indiana | 34 | 16.7 | 4,893,270 | 143,920 | 23.1 | 21 | 10.3 | 1,588,455 | 75,641 | 7.5 |
| Iowa | 7 | 3.4 | 1,073,077 | 153,297 | 22.8 | 10 | 4.8 | 786,186 | 78,619 | 16.7 |
| Kansas | 10 | 4.3 | 1,350,356 | 135,036 | 29.9 | 17 | 7.4 | 1,250,338 | 73,549 | 27.6 |
| Kentucky: | | | | | | | | | | |
| Eastern | 94 | 19.6 | 13,263,371 | 141,100 | 30.9 | 91 | 19.0 | 6,578,897 | 72,296 | 15.3 |
| Western | 32 | 19.9 | 4,489,792 | 140,306 | 36.8 | 37 | 23.0 | 2,652,049 | 71,677 | 21.8 |
| Maryland | 3 | 3.4 | 385,003 | 128,334 | 14.3 | 9 | 10.2 | 752,881 | 83,653 | 27.9 |
| Michigan | 1 | 10.0 | 108,248 | 108,248 | 13.4 | 3 | 30.0 | 197,879 | 65,960 | 24.5 |
| Missouri | 6 | 3.9 | 701,655 | 116,943 | 26.0 | 9 | 5.8 | 701,791 | 77,977 | 26.1 |
| Montana | 3 | 5.8 | 503,536 | 167,845 | 16.5 | 3 | 5.8 | 242,234 | 80,745 | 8.0 |
| New Mexico | 6 | 15.8 | 902,459 | 150,410 | 35.3 | 10 | 26.3 | 765,693 | 76,569 | 30.0 |
| North Dakota | 4 | 2.6 | 577,278 | 144,320 | 43,6 | 2 | 1.3 | 112,366 | 56,183 | 8.5 |
| Ohio | 51 | 8.0 | 7,020,424 | 137,655 | 25.0 | 62 | 9.7 | 4,527,152 | 73,019 | 16.1 |
| Oklahoma | 2 | 2.0 | 296,815 | 148,408 | 12.8 | 10 | 10.0 | 719,698 | 71,970 | 30.9 |
| Pennsylvania | 176 | 8.9 | 24,752,206 | 140,638 | 18.1 | 221 | 11.2 | 15,795,556 | 71,473 | 11.5 |
| Tennessee | 18 | 16.2 | 2,625,221 | 145,846 | 48.1 | 15 | 13.5 | 951,735 | 63,449 | 17.5 |
| Texas | 1 | 2.7 | 129,646 | 129,646 | 12.9 | 1 | 2.7 | 51,466 | 51,466 | 5.1 |
| Utah | 8 | 19.5 | 1,145,076 | 143,135 | 24.4 | 3 | 7.3 | 227,169 | 75,723 | 4.9 |
| Virginia | 12 | 10.6 | 1,437,476 | 119,790 | 11.2 | 17 | 15.1 | 1,197,399 | 70,435 | 9.4 |
| Washington | 5 | 8.9 | 720,774 | 144,155 | 28.4 | 5 | 8.9 | 404,395 | 80,879 | 15.9 |
| West Virginia | 234 | 19.9 | 33,223,650 | 141,981 | 27.2 | 226 | 19.3 | 16,092,555 | 71,206 | 13.1 |
| Wyoming | 21 | 34.4 | 3,096,212 | 147,439 | 47.2 | 11 | 18.0 | 868,485 | 78,953 | 13.3 |
| | 833 | 11.6 | 117,985,810 | 141,640 | 22.7 | 891 | 12.5 | 64,577,627 | 72,478 | 12.4 |

| State | Class 4 (10,000 to 50,000 tons) | | | | | Class 5 (less than 10,000 tons) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mines | | Production | | | Mines | | Production | | |
| | Number | Percentage | Total (net tons) | Average per mine (net tons) | Percentage | Number | Percentage | Total (net tons) | Average per mine (net tons) | Percentage |
| Alabama | 73 | 30.5 | 2,014,374 | 27,594 | 10.1 | 57 | 23.9 | 190,519 | 3,342 | 1.0 |
| Alaska | 3 | 33.3 | 78,657 | 26,219 | 94.9 | 6 | 66.7 | 4.211 | 702 | 5.1 |
| Arkansas | 43 | 44.8 | 917,741 | 21,343 | 75.2 | 51 | 53.1 | 175,775 | 3,447 | 14.4 |
| California, Idaho, and Oregon | 1 | 20.0 | 10,000 | 10,000 | 79.2 | 4 | 80.0 | 2,625 | 656 | 20.8 |
| Colorado | 47 | 20.5 | 1,275,437 | 27,137 | 12.4 | 123 | 53.7 | 323,529 | 2,630 | 3.1 |
| Illinois | 73 | 15.6 | 1,875,379 | 25,690 | 2.8 | 219 | 47.0 | 700,553 | 3,199 | 1.1 |
| Indiana | 50 | 24.6 | 1,204,059 | 24,081 | 5.7 | 62 | 30.6 | 218,972 | 3,532 | 1.0 |
| Iowa | 44 | 21.3 | 970,371 | 22,054 | 20.6 | 141 | 68.1 | 383,013 | 2,716 | 8.1 |
| Kansas | 54 | 23.5 | 1,082,786 | 20,052 | 23.9 | 148 | 64.4 | 533,490 | 3,605 | 11.8 |
| Kentucky: | | | | | | | | | | |
| Eastern | 134 | 27.9 | 3,673,522 | 27,414 | 8.6 | 106 | 22.1 | 466,296 | 4,399 | 1.1 |
| Western | 55 | 34.2 | 1,315,978 | 23,927 | 10.8 | 22 | 13.6 | 76,807 | 3,491 | .6 |
| Maryland | 29 | 33.0 | 761,093 | 26,245 | 28.3 | 44 | 50.0 | 127,481 | 2,897 | 4.7 |
| Michigan | 2 | 20.0 | 29,401 | 14,701 | 3.6 | 2 | 20.0 | 10,185 | 5,093 | 1.3 |
| Missouri | 38 | 24.7 | 978,458 | 25,749 | 36.3 | 101 | 65.6 | 312,311 | 3,092 | 11.6 |
| Montana | 9 | 17.3 | 218,663 | 24,296 | 7.2 | 33 | 63.4 | 92,686 | 2,809 | 3.0 |
| New Mexico | 6 | 15.8 | 126,373 | 21,062 | 4.9 | 14 | 36.8 | 31,857 | 2,276 | 1.2 |
| North Carolina | 2 | 100.0 | 65,153 | 32,577 | 100.0 | ---- | ---- | ---- | ---- | ---- |
| North Dakota | 14 | 9.2 | 340,382 | 24,313 | 25.7 | 132 | 86.9 | 294,594 | 2,232 | 22.2 |
| Ohio | 155 | 24.3 | 3,644,928 | 23,516 | 13.0 | 337 | 52.7 | 1,090,588 | 3,236 | 3.9 |
| Oklahoma | 48 | 48.0 | 1,120,023 | 23,334 | 48.2 | 40 | 40.0 | 189.304 | 4,733 | 8.1 |
| Pennsylvania | 652 | 33.0 | 15,602,866 | 23,931 | 11.4 | 745 | 37.8 | 2,833,792 | 3,804 | 2.0 |
| South Dakota | ---- | ---- | ---- | ---- | ---- | 17 | 100.0 | 14,447 | 850 | 100.0 |
| Tennessee | 37 | 33.3 | 933,316 | 25,225 | 17.1 | 38 | 34.3 | 162,592 | 4,279 | 3.0 |
| Texas | 32 | 86.5 | 807,894 | 25,247 | 80.1 | 3 | 8.1 | 19,369 | 6,456 | 1.9 |
| Utah | 4 | 9.8 | 142,800 | 35,700 | 3.0 | 16 | 39.0 | 55,954 | 3,497 | 1.2 |
| Virginia | 26 | 23.0 | 784,452 | 30,171 | 6.1 | 33 | 29.2 | 108,897 | 3,300 | .9 |
| Washington | 11 | 19.6 | 242,267 | 22,024 | 9.5 | 31 | 55.4 | 103,405 | 3,336 | 4.1 |
| West Virginia | 321 | 27.4 | 8,556,996 | 26,657 | 7.0 | 198 | 16.9 | 837,904 | 4,232 | .7 |
| Wyoming | 6 | 9.8 | 126,612 | 21,102 | 1.9 | 14 | 23.0 | 37,874 | 2,705 | .6 |
| | 1,969 | 27.6 | 48,899,981 | 24,835 | 9.4 | 2,737 | 38.3 | 9,399,030 | 3,434 | 1.8 |

*Number and production of commercial bituminous coal mines, by size classes, in 1925*—(Continued)

| State | Total | | |
|---|---|---|---|
| | | (Production (net tons) | |
| | Mines | Total | Average per mine |
| Alabama | 239 | 20,004,395 | 83,700 |
| Alaska | 9 | 82,868 | 9,208 |
| Arkansas | 96 | 1,220,039 | 12,709 |
| California, Idaho, and Oregon | 5 | 12,625 | 2,525 |
| Colorado | 229 | 10,310,551 | 45,024 |
| Georgia | 1 | 66,174 | 66,174 |
| Illinois | 466 | 66,909,359 | 143,582 |
| Indiana | 203 | 21.224,966 | 104,556 |
| Iowa | 207 | 4,714,843 | 22,777 |
| Kansas | 230 | 4,524,251 | 19,671 |
| Kentucky: | | | |
| Eastern | 480 | 42,882,113 | 89,338 |
| Western | 161 | 12,186,557 | 75,693 |
| Maryland | 88 | 2,694,572 | 30,620 |
| Michigan | 10 | 808,233 | 80,823 |
| Missouri | 154 | 2,694,215 | 17,495 |
| Montana | 52 | 3,043,686 | 58,532 |
| New Mexico | 38 | 2,556,851 | 67,286 |
| North Carolina | 2 | 65,153 | 32,577 |
| North Dakota | 152 | 1,324,620 | 8,715 |
| Ohio | 639 | 28,034,112 | 43,872 |
| Oklahoma | 100 | 2,325,840 | 23,258 |
| Pennsylvania | 1,974 | 136,928,019 | 69,366 |
| South Dakota | 17 | 14,447 | 850 |
| Tennessee | 111 | 5,454,011 | 49,135 |
| Texas | 37 | 1,008,375 | 27,253 |
| Utah | 41 | 4,690,342 | 114.399 |
| Virginia | 113 | 12,799,443 | 113,269 |
| Washington | 56 | 2,537,890 | 45,319 |
| West Virginia | 1,173 | 122,380,959 | 104,332 |
| Wyoming | 61 | 6,553,232 | 107,430 |
| | 7,144 | 520,052,741 | 72,796 |

## VALUE OF COAL PRODUCED

### DEFINITION OF VALUES REPORTED

The value given in this report is the amount received at the mines f. o. b cars, less selling expense, and the average value per ton is the average amount received, obtained by dividing the total value by the number of tons sold or produced. Coal used at the mines, coal coked by the producing company, and coal used in some other industry by that company—in all, forming a considerable part of the total output—is not sold, and the value placed upon it is either an estimate or the amount at which it is carried on the company's books. Either value is presumably the amount the coal would have brought if it had been sold or the amount other fuel for the purpose stated would have cost if it had been purchased. In other words, the values given represent returns to the operators for coal sold plus the estimated value of that not sold. The value thus fixed is more or less arbitrary and does not necessarily represent the current prices for coal sold commercially. Many mines are owned by consumers who take all or a great part of their output at nominal prices. The output of such "captive mines" is not known accurately, but it is probably between 20 and 25 per cent of the entire production. Even where the coal is actually sold large quantities may be moved on "cost-plus" contracts that provide for prices below the average spot prices in the field or the average prices received for coal delivered under ordinary contracts. The figures in the following tables, therefore, do not necessarily show prices or even an average of the prices of coal at the mines. Taken over a period of years, however, they do furnish an index to the rise and fall in the value of coal.

The computed "average value per ton" is thus affected by the value placed by the operator upon coal used at the mine but not shipped. In order to ascertain how large an influence the inclusion of this non-commercial coal might have upon the average, the operators were requested for several years to give separate statements of value for coal loaded at the mines for shipment, for sales to local trade, and for mine fuel and coal made into beehive coke. It was found, however, that for practical purposes the average value of all the coal produced may be accepted as a measure of the average value of the coal shipped. The values placed by operators on mine fuel and upon the coal coked were generally somewhat less than the average amounts received for the coal shipped, but the quantities to which these lower values applied were so much smaller than the quantity shipped that they affected only slightly the average for all coal produced.

## ESTIMATES OF VALUE INCLUDED IN THE STATISTICS

If an operator who is known to have produced coal during the year will make no report of the value of his product to the Bureau of Mines, an estimate of the value is included in the total in order to make it complete. These estimates are based on the average for each county as obtained from all reports of the operators in the county that did specify value.

The percentage of the total value of the product in each State in 1925 represented in this report by estimates is shown in the following table:

*Percentage of total value of bituminous coal produced by commercial operators that is represented by estimates, by States, 1923-1925*

| State | 1923 | 1924 | 1925 | State | 1923 | 1924 | 1925 |
|---|---|---|---|---|---|---|---|
| Alabama | 8.3 | 7.9 | 28.5 | North Dakota | .9 | 1.6 | 3.6 |
| Arkansas | 15.5 | 6.5 | 25.4 | Ohio | 3.4 | 2.4 | 5.0 |
| Colorado | 7.1 | 5.1 | 3.3 | Oklahoma | 18.4 | 19.5 | 21.0 |
| Idaho | ------- | ------- | 100.0 | Pennsylvania | 3.4 | 2.8 | 3.7 |
| Illinois | 5.8 | 2.2 | 2.1 | South Dakota | 1.4 | .7 | 33.3 |
| Indiana | 9.4 | 5.5 | 4.5 | Tennessee | 6.8 | 1.1 | 11.1 |
| Iowa | .2 | 22.8 | 24.9 | Texas | 21.0 | 23.5 | 47.0 |
| Kansas | 12.5 | 12.8 | 14.0 | Utah | .2 | .04 | ------- |
| Kentucky | 14.1 | 6.7 | 9.5 | Virginia | 3.2 | .4 | 4.1 |
| Maryland | 3.5 | 11.7 | 1.5 | Washington | 16.3 | 31.0 | .9 |
| Michigan | ------- | .4 | ------- | West Virginia | 8.1 | 5.1 | 5.2 |
| Missouri | 6.8 | 2.5 | .6 | Wyoming | 3.3 | 5.2 | 1.5 |
| Montana | 2.4 | .4 | 1.1 | Other States | ------- | 25.8 | ------- |
| New Mexico | .3 | .1 | ------- | | | | |
| North Carolina | 58.3 | ------- | ------- | United States | 6.2 | 4.6 | 6.0 |

Of the $1,060,402,000 given as the total value of bituminous coal at the mines in 1925, $63,211,000, or 6 per cent, represents estimates of the value of the output of commercial mines. In the average for the whole country the proportion estimated is not large enough to introduce an appreciable error, but in the figures for some of the States the error may be more serious.

*Production and value of anthracite and bituminous coal, by States, 1924-25*

| State | 1924 |  |  | 1925 |  |  |
|---|---|---|---|---|---|---|
|  | Net tons | Value |  | Net tons | Value |  |
|  |  | Total | Average per ton |  | Total | Average per ton |
| Alabama | 19,130,184 | $44,756,000 | $2.34 | 20,004,395 | $42,442,000 | $2.12 |
| Alaska | 99,663 | 560,000 | 5.62 | 82,868 | 405,000 | 4.80 |
| Arkansas | 1,451,503 | 5,898,000 | 4.06 | 1,220,039 | 4,829,000 | 3.96 |
| California, Idaho, Nebraska, and Oregon* | 16,953 | 71,000 | 4.19 | 12,625 | 60,000 | 4.75 |
| Colorado | 10,444,098 | 31,863,000 | 3.05 | 10,310,551 | 30,322,000 | 2.94 |
| Georgia | 74,947 | 271,000 | 3.62 | 66,174 | 220,000 | 3.32 |
| Illinois | 68,323,281 | 155,260,000 | 2.27 | 66,909,359 | 146,492,000 | 2.19 |
| Indiana | 21,480,213 | 46,453,000 | 2.16 | 21,224,966 | 42,884,000 | 2.02 |
| Iowa | 5,468,450 | 18,097,000 | 3.31 | 4,714,843 | 14,807,000 | 3.14 |
| Kansas | 4,247,733 | 12,854,000 | 3.03 | 4,524,251 | 13,013,000 | 2.88 |
| Kentucky | 45,147,204 | 84,733,000 | 1.88 | 55,068,670 | 94,825,000 | 1.72 |
| Maryland | 2,133,703 | 4,629,000 | 2.17 | 2,694,572 | 5,312,000 | 1.97 |
| Michigan | 831,020 | 3,602,000 | 4.33 | 808,233 | 3,391,000 | 4.20 |
| Missouri | 2,480,880 | 8,154,000 | 3.29 | 2,694,215 | 8,281,000 | 3.07 |
| Montana | 2,905,365 | 8,596,000 | 2.96 | 3,043,686 | 7,879,000 | 2.59 |
| New Mexico | 2,786,063 | 9,774,000 | 3.51 | 2,556,851 | 8,611,000 | 3.37 |
| North Carolina | 57,094 | 224,000 | 3.92 | 65,153 | 283,000 | 4.34 |
| North Dakota | 1,200,527 | 2,473,000 | 2.06 | 1,324,620 | 2,445,000 | 1.85 |
| Ohio | 30,473,007 | 62,011,000 | 2.03 | 28,034,112 | 54,057,000 | 1.93 |
| Oklahoma | 2,329,615 | 8,590,000 | 3.69 | 2,325,840 | 7,667,000 | 3.30 |
| Pennsylvania, bituminous | 130,633,773 | 295,164,000 | 2.26 | 136,928,019 | 287,899,000 | 2.10 |
| South Dakota | 12,043 | 36,000 | 2.99 | 14,447 | 42,000 | 2.91 |
| Tennessee | 4,556,555 | 9,711,000 | 2.13 | 5,454,011 | 10,077,000 | 1.85 |
| Texas | 1,147,011 | 1,721,000 | 1.50 | 1,008,375 | 1,566,000 | 1.55 |
| Utah | 4,488,157 | 12,057,000 | 2.69 | 4,690,342 | 11,991,000 | 2.56 |
| Virginia | 10,693,464 | 21,823,000 | 2.04 | 12,799,443 | 23,496,000 | 1.84 |
| Washington | 2,653,667 | 9,689,000 | 3.65 | 2,537,890 | 9,176,000 | 3.62 |
| West Virginia | 101,662,897 | 185,229,000 | 1.82 | 122,380,959 | 209,655,000 | 1.71 |
| Wyoming | 6,757,468 | 18,327,000 | 2.71 | 6,553,232 | 18,275,000 | 2.79 |
| Total bituminous | 483,686,538 | 1,062,626,000 | 2.20 | 520,052,741 | 1,060,402,000 | 2.04 |
| Pennsylvania anthracite | 87,926,862 | 477,231,000 | 5.43 | 61,817,149 | 327,665,000 | 5.30 |
| Grand total | 571,613,400 | 1,539,857,000 | 2.69 | 581,869,890 | 1,388,067,000 | 2.38 |

*No production in Nebraska in 1925.

*Average value per ton of coal at the mines, by States, 1917-1925*

| State | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Average | Increase or decrease |
| Alabama | $2.27 | $2.85 | $2.96 | $3.65 | $3.08 | $2.34 | $2.52 | $2.34 | $2.12 | —$0.22 |
| Alaska | 4.92 | 5.45 | 5.66 | 5.83 | 6.46 | 5.43 | 6.30 | 5.62 | 4.80 | —.73 |
| Arkansas | 2.56 | 3.67 | 3.70 | 4.56 | 4.37 | 4.14 | 4.01 | 4.06 | 3.96 | —.10 |
| California* | 2.30 | 2.70 | 3.38 | 4.36 | 4.66 | 3.87 | 3.94 | 4.19 | 4.75 | +.56 |
| Colorado | 2.22 | 2.69 | 2.78 | 3.49 | 3.55 | 3.16 | 3.22 | 3.05 | 2.94 | —.11 |
| Georgia | 2.53 | 3.59 | 3.71 | 5.00 | 2.14 | 4.06 | 4.32 | 3.62 | 3.32 | —.30 |
| Illinois | 1.88 | 2.32 | 2.30 | 3.08 | 2.74 | 2.89 | 2.50 | 2.27 | 2.19 | —.08 |
| Indiana | 1.99 | 2.29 | 2.22 | 3.16 | 2.57 | 2.85 | 2.48 | 2.16 | 2.02 | —.14 |
| Iowa | 2.35 | 3.02 | 3.09 | 3.94 | 3.81 | 3.72 | 3.59 | 3.31 | 3.14 | —.17 |
| Kansas | 2.31 | 2.91 | 3.05 | 3.87 | 3.85 | 3.66 | 3.21 | 3.03 | 2.88 | —.15 |
| Kentucky | 2.17 | 2.55 | 2.46 | 4.11 | 2.69 | 3.02 | 2.54 | 1.88 | 1.72 | —.16 |
| Maryland | 2.46 | 2.77 | 2.73 | 4.63 | 3.61 | 3.37 | 3.02 | 2.17 | 1.97 | —.20 |
| Michigan | 3.22 | 3.83 | 3.88 | 4.93 | 4.87 | 5.05 | 4.73 | 4.33 | 4.20 | —.13 |
| Missouri | 2.43 | 3.02 | 3.21 | 4.16 | 3.92 | 3.81 | 3.40 | 3.29 | 3.07 | —.22 |
| Montana | 2.11 | 2.53 | 2.67 | 3.16 | 3.26 | 3.19 | 3.07 | 2.96 | 2.59 | —.37 |
| New Mexico | 1.86 | 2.68 | 3.11 | 3.68 | 3.91 | 3.49 | 3.66 | 3.51 | 3.37 | —.14 |
| North Carolina | | 4.75 | 3.84 | 7.02 | 5.76 | 4.94 | 3.66 | 3.92 | 4.34 | +.42 |
| North Dakota | 1.80 | 2.45 | 2.50 | 2.87 | 2.69 | 2.65 | 2.36 | 2.06 | 1.85 | —.21 |
| Ohio | 2.48 | 2.58 | 2.22 | 3.82 | 2.65 | 3.23 | 2.43 | 2.03 | 1.93 | —.10 |
| Oklahoma | 2.81 | 3.64 | 3.83 | 4.80 | 4.62 | 4.11 | 3.77 | 3.69 | 3.30 | —.39 |
| Oregon | 3.38 | 2.81 | 3.40 | 4.49 | * | * | * | * | * | * |
| Pennsylvania, bituminous | 2.44 | 2.59 | 2.42 | 3.77 | 2.78 | 3.11 | 2.75 | 2.26 | 2.10 | —.16 |
| South Dakota | 2.90 | 2.80 | 3.17 | 3.60 | 2.81 | 2.84 | 2.41 | 2.99 | 2.91 | —.08 |
| Tennessee | 2.19 | 2.83 | 2.77 | 4.02 | 3.35 | 2.89 | 2.73 | 2.13 | 1.85 | —.28 |
| Texas | 1.77 | 2.63 | 2.69 | 3.75 | 2.64 | 2.32 | 1.82 | 1.50 | 1.55 | +.05 |
| Utah | 2.07 | 2.71 | 2.76 | 3.22 | 3.35 | 3.14 | 2.89 | 2.69 | 2.56 | —.13 |
| Virginia | 2.00 | 2.51 | 2.55 | 3.99 | 3.06 | 2.58 | 2.76 | 2.04 | 1.84 | —.20 |
| Washington | 2.68 | 3.46 | 3.58 | 3.88 | 4.03 | 3.98 | 3.72 | 3.65 | 3.62 | —.03 |
| West Virginia | 2.32 | 2.56 | 2.49 | 4.34 | 2.84 | 2.93 | 2.65 | 1.82 | 1.71 | —.11 |
| Wyoming | 1.93 | 2.39 | 2.60 | 2.98 | 3.24 | 3.04 | 2.76 | 2.71 | 2.79 | +.08 |
| Total bituminous | 2.26 | 2.58 | 2.49 | 3.75 | 2.89 | 3.02 | 2.68 | 2.20 | 2.04 | —.16 |
| Pennsylvania anthracite** | 2.85 | 3.40 | 4.14 | 4.85 | 5.00 | 5.01 | 5.43 | 5.43 | 5.30 | —.13 |

*California includes Idaho, 1917-1925; Nebraska, 1924; and Oregon, 1921-1925.

**These values represent amounts per net ton and include all coal produced.

## BITUMINOUS COAL LOADED FOR SHIPMENT BY RAILROADS AND WATERWAYS

The next table was compiled by the Bureau of Mines from replies of mine operators to the following question:

Railroads or waterways on which product was first loaded for shipment:
Name of road or waterway—
(Give shipments over each road separately.) Tons

The information is complete, all operations of which the Bureau of Mines has record as producing in 1925 being accounted for. It shows a total of 477,172,812 net tons loaded at mines for the shipment. The remainder of the 520,052,741 tons produced consists of mine fuel, coal coked at mines, coal loaded direct into locomotive tenders at tipple, and local sales.

As these statistics include nonrevenue railroad fuel they may differ from those compiled by the railroad companies, which often show only revenue freight and include coal received from connecting lines or coal shipped off the Lake docks as well as that originating at mines on the lines reporting.

*Bituminous coal loaded for shipment by railroads and waterways in 1925, in net tons*—(Continued)

| Route | State | Quantity | |
|---|---|---|---|
| | | By State | Total for route |
| RAILROADS—Continued | | | |
| Cleveland, Cincinnati, Chicago & St. Louis | Illinois | 5,760,770 | 6,909,550 |
| | Indiana | 1,148,780 | |
| Clinchfield | Kentucky | 30,312 | 2,593,610 |
| | Virginia | 2,563,298 | |
| Colfax Northern | Iowa | 5,615 | 5,615 |
| Colorado & Southeastern | Colorado | 371,813 | 371,813 |
| Colorado & Southern | do | 2,430,435 | 2,430,435 |
| Colorado & Wyoming | do | 248,252 | 248,252 |
| Conemaugh & Black Lick | Pennsylvania | 120,914 | 120,914 |
| Crystal River & San Juan | Colorado | 1,600 | 1,600 |
| Cumberland & Manchester | Kentucky | 101,887 | 101,887 |
| Cumberland & Pennsylvania | Maryland | 1,289,063 | 1,289,063 |
| Dardanelle & Russellville | Arkansas | 17,390 | 17,390 |
| Dents Run | Pennsylvania | 53,011 | 53,011 |
| Denver & Intermountain | Colorado | 89,923 | 89,923 |
| Denver2& Rio Grande Western | do | 2,885,420 | 5,194,594 |
| | New Mexico | 19,886 | |
| | Utah | 2,289,288 | |
| Denver & Salt Lake | Colorado | 951,400 | 951,400 |
| Des Moines & Central Iowa | Iowa | 193,423 | 193,423 |
| Detroit, Toledo & Ironton | Ohio | 11,890 | 11,890 |
| East Broad Top R. R. & Coal Co. | Pennsylvania | 669,658 | 669,658 |
| Eastern Kentucky | Kentucky | 5,364 | 5,364 |
| Eastern Railway & Lumber Co. | Washington | 17,427 | 17,427 |
| East St. Louis & Suburban | Illinois | 36,239 | 36,239 |
| Elgin, Joilet & Eastern | do | 48,405 | 48,405 |
| El Paso & Southwestern | New Mexico | 656,394 | 656,394 |
| Erie | Ohio | 68,920 | 1,677,977 |
| | Pennsylvania | 1,609,057 | |
| Evansville & Ohio Valley | Indiana | 62,720 | 62,720 |
| Evansville, Indianapolis & Terre Haute | do | 2,191,643 | 2,191,643 |
| Evansville, Suburban & Newburgh | do | 55,859 | 55,859 |
| Federal Valley | Ohio | 21,121 | 21,121 |
| Fort Dodge, Des Moines & Southern | Iowa | 21,543 | 21,543 |
| Fort Smith & Western | Oklahoma | 75,002 | 75,002 |
| Fort Smith, Sublaco & Rock Island | Arkansas | 23,642 | 23,642 |
| Galesburg & Great Eastern | Illinois | 1,095 | 1,095 |
| Galveston, Harrisburg & San Antonio | Texas | 15,466 | 15,466 |
| Great Northern | Montana | 408,489 | 1,003,688 |
| | North Dakota | 342,078 | |
| | Washington | 253,121 | |
| Greenbrier & Eastern | West Virginia | 800,248 | 800,248 |
| Harriman & Northeastern | Tennessee | 283,669 | 283,669 |
| Hartland | West Virginia | 148,089 | 148,089 |
| Hocking Valley | Ohio | 1,487,388 | 1,487,388 |
| Houston & Texas Central | Texas | 47,145 | 41,145 |
| Houston East & West Texas | do | 111,910 | 110,910 |
| Huntingdon & Broad Top Mountain | Pennsylvania | 557,222 | 557,222 |
| *Illinois Central* | *Alabama* | 149,440 | 18,590,892 |
| | Illinois | 11,298,622 | |
| | Indiana | 306,899 | |
| | Kentucky | 6,835,931 | |
| Illinois Terminal | Illinois | 28,885 | 28,885 |
| Illinois Traction | do | 983,018 | 983,018 |
| Indiana County Street Railway | Pennsylvania | 930 | 930 |
| Indian Creek Valley | do | 585,287 | 585,287 |
| International & Great Northern | Texas | 160,631 | 160,631 |
| Interstate | Kentucky | 85,689 | 2,872,427 |
| | Virginia | 2,786,738 | |
| Iowa,Southern Utilities Co. | Iowa | 90,038 | 90,038 |
| Jefferson Southwestern | Illinois | 415,415 | 415,415 |
| Johnstown & Stony Creek | Pennsylvania | 52,524 | 52,524 |
| Joplin & Pittsburg | Kansas | 47,336 | 47,336 |
| Kanawha & West Virginia | Ohio | 951,883 | 1,013,083 |
| | West Virginia | 61,200 | |
| Kanawha Central | do | 50,849 | 50,849 |
| Kanawha, Glen Jean & Eastern | do | 183,744 | 183,744 |
| Kansas City, Clay County & St. Joseph | do | 994,406 | 994,406 |
| | Missouri | 1,305 | 1,305 |
| Kansas City Southern | Kansas | 335,729 | 751,988 |
| | Missouri | 357,113 | |
| | Oklahoma | 59,146 | |
| Kansas, Oklahoma & Gulf | do | 198,314 | 198,314 |

### *Bituminous coal loaded for shipment by railroads and waterways in 1925, in net tons*—(Continued)

| Route | State | Quantity | |
|---|---|---|---|
| | | By State | Total for route |
| RAILROADS—Continued | | | |
| Kentucky & Tennessee | Kentucky | 801,750 | 801,750 |
| Lake Erie, Franklin & Clarion | Pennsylvania | 328,874 | 328,874 |
| Laramine, North Park & Western | Colorado | 58,259 | 58,259 |
| Lenox | Kentucky | 5,240 | 5,240 |
| Ligonier Valley | Pennsylvania | 390,126 | 390,126 |
| Litchfield & Madison | Illinois | 778,594 | 778,594 |
| Louisiana Railway & Navigation Co. of Texas | Texas | 51,654 | 51,654 |
| *Louisville & Nashville* | *Alabama* | 4,377,601 | 35,173,384 |
| | Illinois | 322,400 | |
| | Kentucky | 29,256,812 | |
| | Tennessee | 945,982 | |
| | Virginia | 270,589 | |
| Louisville, Henderson & St. Louis | Kentucky | 103,588 | 103,582 |
| Marion & Eastern | Illinois | 148,812 | 148,818 |
| Michigan | Michigan | 367,481 | 367,481 |
| Midland Valley | Arkansas | 212,155 | 433,328 |
| | Oklahoma | 221,173 | |
| Minneapolis & St. Louis | Illinois | 521,714 | 722,563 |
| | Iowa | 200,849 | |
| Minneapolis, St. Paul & Sault Ste. Marie | North Dakota | 175,271 | 175,271 |
| Missouri-Illinois | Illinois | 394,686 | 394,686 |
| Missouri, Kansas & Texas | Kansas | 129,613 | 626,824 |
| | Missouri | 20,184 | |
| | Oklahoma | 315,850 | |
| | Texas | 161,177 | |
| Missouri Pacific | Arkansas | 726,794 | 7,099,647 |
| | Illinois | 4,541,974 | |
| | Kansas | 1,189,120 | |
| | Missouri | 641,759 | |
| *Mobile & Ohio* | *Alabama* | 647,565 | 1,090,456 |
| | Illinois | 442,891 | |
| Monongahela | Pennsylvania | 4,126,910 | 11,386,992 |
| | West Virginia | 7,260,082 | |
| Monongahela Valley Traction Co. | Ohio | 592 | 592 |
| Montana | Arkansas | 57,996 | 57,996 |
| Montana, Wyoming & Southern | Montana | 404,975 | 404,975 |
| Montour | Pennsylvania | 2,171,265 | 2,171,265 |
| Morehead & North Fork | Kentucky | 686 | 686 |
| Morgan & Fentress | Tennessee | 17,927 | 17,927 |
| Morgantown & Kingwood | West Virginia | 42,651 | 42,651 |
| *Nashville, Chattanooga & St. Louis* | *Alabama* | 310 | 958,794 |
| | Tennessee | 958,484 | |
| National Coal Railroad Co. | Utah | 9,333 | 9,333 |
| New Mexico Central | New Mexico | 730 | 730 |
| New Mexico Midland | do | 73,951 | 73,951 |
| New York Central | Ohio | 3,219,468 | 11,194,712 |
| | Pennsylvania | 5,849,124 | |
| | West Virginia | 2,126,120 | |
| New York, Chicago & St. Louis | Illinois | 620,126 | 624,142 |
| | Indiana | 4,016 | |
| Norfolk & Western | Kentucky | 4,829,369 | 38,587,595 |
| | Virginia | 3,501,804 | |
| | West Virginia | 30,256,422 | |
| Norfolk Southern | North Carolina | 58,160 | 58,160 |
| *Northern Alabama* | *Alabama* | 476,137 | 476,137 |
| Northern Ohio Traction & Light Co. | Ohio | 10,546 | 10,546 |
| Northern Pacific | Montana | 1,089,025 | 2,863,303 |
| | North Dakota | 417,464 | |
| | Washington | 1,356,814 | |
| Norton & Northern | Virginia | 120,146 | 120,146 |
| Ohio & Kentucky | Kentucky | 17,253 | 17,253 |
| Oklahoma City-Ada-Atoka | Oklahoma | 23,737 | 23,737 |
| Oneida & Western | Tennessee | 1,492 | 1,492 |
| Oregon Short Line | Idaho | 1,000 | 1,285,660 |
| | Wyoming | 1,284,660 | |
| Oregon-Washington Railroad & Navigation Co. | Washington | 254,333 | 254,333 |
| Pacific Coast | do | 401,636 | 401,636 |
| Pennsylvania (Includes Ohio River & Western, Pittsburgh, Cincinnati, Chicago & St. Louis, and Pittsburgh, Virginia & Charleston). | Illinois | 846,023 | 59,842,205 |
| | Indiana | 3,991,962 | |
| | Maryland | 378 | |
| | Ohio | 4,487,110 | |
| | Pennsylvania | 49,345,557 | |
| | West Virginia | 1,171,175 | |

*Bituminous coal loaded for shipment by railroads and waterways in 1925, in net tons*—(Continued)

| Route | State | Quantity | |
|---|---|---|---|
| | | By State | Total for route |
| RAILROADS—continued | | | |
| Peoria & Pekin Union | Illinois | 285,882 | 285,882 |
| Peoria, Hanna City & Western | do | 488,569 | 488,569 |
| Pere Marquette | Michigan | 373,968 | 373,968 |
| Peru, La Salle & Deer Park | Illinois | 69,611 | 69,611 |
| Pittsburg County Railway Co. | Oklahoma | 30,000 | 30,000 |
| Pittsburgh & Lake Erie | Pennsylvania | 2,138,108 | 2,138,108 |
| Pittsburg & Shawmut | do | 1,782,244 | 1,782,244 |
| Pittsburgh & Susquehanna | do | 156,999 | 156,999 |
| Pittsburgh & West Virginia | Ohio | 552,662 | 5,293,344 |
| | Pennsylvania | 4,474,442 | |
| | West Virginia | 266,240 | |
| Pittsburgh, Chartiers & Youghiogheny | Pennsylvania | 137,106 | 137,106 |
| Pittsburgh, Harmony, Butler & New Castle | do | 19,383 | 19,383 |
| Pittsburgh, Lisbon & Western | do | 190,006 | 190,006 |
| Pittsburg, Shawmut & Northern | do | 571,472 | 571,472 |
| Pond Fork & Bald Knob | West Virginia | 47,000 | 47,000 |
| Preston | Maryland | 268 | 149,531 |
| | West Virginia | 149,263 | |
| Puget Sound Electric | Washington | 15,463 | 15,463 |
| Quincy, Omaha & Kansas City | Missouri | 20.142 | 20,142 |
| Reynoldsville & Falls Creek | Pennsylvania | 78,329 | 78,329 |
| Rio Grande & Eagle Pass | Texas | 21,057 | 21,057 |
| Rio Grande Eastern | New Mexico | 12,000 | 12,000 |
| Rio Grande Southern | Colorado | 49,657 | 49,657 |
| Rock Castle River | Kentucky | 3,448 | 3,448 |
| Rockdale, Sandow & Southern | Texas | 127,871 | 127,871 |
| Rock Island Southern | Illinois | 56,737 | 56,737 |
| St. Louis & Belleville Electric | do | 39,435 | 39,435 |
| St. Louis & Hannibal | Missouri | 16,101 | 16,101 |
| St. Louis & O'Fallon | Illinois | 665,249 | 665,249 |
| St. Louis & Ohio River | do | 11,622 | 11,622 |
| *St. Louis-San Francisco* | *Alabama* | 2,814,034 | 5,452,310 |
| | Arkansas | 134,521 | |
| | Kansas | 1,571,368 | |
| | Missouri | 477,256 | |
| | Oklahoma | 455,131 | |
| St. Louis, Southwestern of Texas | Texas | 106,425 | 106,425 |
| St. Louis, Troy & Eastern | Illinois | 673,404 | 673,404 |
| San Antonio & Aransas Pass | Texas | 15,454 | 15,454 |
| San Antonio Southern | Illinois | 18,250 | 18,250 |
| Sandy Valley & Elkhorn | Texas | 2,148,722 | 2,148,722 |
| Scotts Run | do | 1,174,588 | 1,174,588 |
| *Seaboard Air Line* | Kentucky | 6,398 | 6,398 |
| Sewell Valley | West Virginia | 114,922 | 114,922 |
| *Southern* | *Alabama* | 3,923,486 | 11,024,366 |
| | Illinois | 854,564 | |
| | Indiana | 1,222,262 | |
| | Kentucky | 542,911 | |
| | Tennessee | 1,716,379 | |
| | Virginia | 2,764,764 | |
| Southern Pacific | Oregon | 3,900 | 3,900 |
| Springfield Terminal | Illinois | 57 | 57 |
| Strouds Creek & Muddlety | West Virginia | 52,005 | 52,005 |
| Susquehanna & New York | Pennsylvania | 30,241 | 30,241 |
| Tennessee | Tennessee | 327,341 | 327,341 |
| Tennessee Central | do | 733,610 | 733,610 |
| *Tennessee Coal, Iron & R. R. Co.* | *Alabama* | 3,313,167 | 3,313,167 |
| Texas & Pacific | Texas | 115,034 | 115,034 |
| Texas Short Line | do | 10,000 | 10,000 |
| *Thomas & Sayreton* | *Alabama* | 445,810 | 445,810 |
| Toledo & Ohio Central | Ohio | 1,217,147 | 1,217,147 |
| Toledo, Peoria & Western | Illinois | 188,833 | 188,833 |
| Toronto, Knoxville & Western | Ohio | 62,529 | 62,529 |
| Uintah | Colorado | 10,674 | 10,674 |
| Union | Pennsylvania | 130,410 | 130,410 |
| Union Pacific | Colorado | 1,213,553 | 4,839,513 |
| | Kansas | 10,000 | |
| | Utah | 49,049 | |
| | Wyoming | 3,566,911 | |
| Unity | Pennsylvania | 925,091 | 925,091 |
| Ursina & North Fork | do | 4,578 | 4,578 |
| Utah | Utah | 1,589,083 | 1,589,083 |

*Bituminous coal loaded for shipment by railroads and waterways in 1925, in net tons*—(Continued)

| Route | State | Quantity | |
|---|---|---|---|
| | | By State | Total for route |
| RAILROADS—continued | | | |
| Virginian | Virginia | 24,982 | 8,127,386 |
| | West Virginia | 8,102,404 | |
| Wabash | Illinois | 2,784,790 | 3,073,426 |
| | Iowa | 232,984 | |
| | Missouri | 55,652 | |
| | Illinois | 56,577 | 56,577 |
| Wabash, Chester & Western | Pennsylvania | 456,786 | 456,786 |
| Washington Run | do | 463,869 | 463,869 |
| Western Allegheny | Maryland | 1,122,803 | 3,991,384 |
| Western Maryland | Pennsylvania | 603,969 | |
| | West Virginia | 2,264,612 | |
| West Virginia Northern | do | 411,270 | 411,270 |
| Wheeling & Lake Erie | Ohio | 4,592,113 | 4,592,113 |
| *Woodward Iron Co.* | *Alabama* | 962,629 | 962,629 |
| Wyoming | Wyoming | 768 | 768 |
| Youngstown & Ohio River | Ohio | 122,416 | 122,416 |
| Zanesville & Western | do | 889,606 | 889,606 |
| Total railroad shipments | | 460,232,442 | 460,232,442 |
| WATERWAYS | | | |
| Allegheny River | Pennsylvania | 485,241 | 485,241 |
| *Black Warrior River* | *Alabama* | 74,675 | 74,675 |
| Great Kanawha River | West Virginia | 426,067 | 426,067 |
| Green River | Kentucky | 35,329 | 35,329 |
| Illinois River | Illinois | 9,185 | 9,185 |
| Monongahela River | Pennsylvania | 15,531,836 | 15,531,836 |
| Muskingum River | Ohio | 50,000 | 50,000 |
| Ohio River | Kentucky | 269,389 | 327,123 |
| | Ohio | 2,265 | |
| | Pennsylvania | 2,544 | |
| | West Virginia | 52,925 | |
| Tradewater River | Kentucky | 914 | 914 |
| Total waterway shipments | | 16,940,370 | 16,940,370 |
| Grand total, loaded at mines for shipment by railroads and waterways. | | 477,172,812 | 477,172,812 |
| Sold to local trade and used by employees | | 21,351,223 | 21,351,223 |
| Used at mines for steam and heat | | 5,776,103 | 5,776,103 |
| Made into coke at mines | | 15,752,603 | 15,752,603 |
| Total production | | 520,052,741 | 520,052,741 |

## DETAILED STATISTICS OF BITUMINOUS COAL IN ALABAMA BY COUNTIES

### TABLES OF PRODUCTION, VALUE, MEN EMPLOYED, DAYS WORKED, AND OUTPUT PER MAN IN 1925

The following table presents the detailed data for each coal-producing county from which three or more operators reported production. Where less than three reports were received the figures for two or more counties have been combined to avoid disclosing individual returns.

This series gives the details of value of product, men employed by broad occupational groups, average number of days worked by the mines, and average output per man per day.

*Production, value, men employed, days worked, and output per man at coal mines in Alabama by counties in 1925*

(Note that figures relate only to active mines of commercial size; no canvass of wagon mines was made)

| County | Net tons | | | | | Value | | Number of employees | | | | | Average number of days worked | Average tons per man per day |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Underground | | | | | | |
| | Loaded at mines for shipment | Sold to local trade and used by employees | Used at mines for steam and heat | Made into coke at mines | Total quantity | Total | Average per ton | Miners, loaders, and shot firers | Haulage and track | All others | Surface | Total | | |
| Bibb | 1,157,709 | 6,915 | 23,566 | .......... | 1,188,190 | $3,005,000 | $2.53 | 1,135 | 210 | 254 | 290 | 1,889 | 224 | 2.81 |
| Blount | 258,934 | 4,199 | 7,720 | .......... | 270,853 | 599,000 | 2.21 | 333 | 42 | 43 | 79 | 497 | 217 | 2.51 |
| Etowah | 124,477 | 1,284 | 2,231 | .......... | 127,992 | 321,000 | 2.51 | 158 | 19 | 22 | 49 | 248 | 272 | 1.89 |
| Fayette and Marion | 150,278 | 1,808 | 600 | .......... | 152,746 | 460,000 | 3.01 | 200 | 27 | 19 | 55 | 301 | 172 | 2.95 |
| Jefferson | 9,308,254 | 130,304 | 169,927 | 93,700 | 9,702,185 | 20,664,000 | 2.13 | 7,054 | 1,498 | 2,112 | 1,876 | 12,540 | 268 | 2.88 |
| St. Clair | 815,327 | 4,489 | 31,743 | .......... | 851,559 | 1,876,000 | 2.20 | 508 | 110 | 145 | 139 | 902 | 276 | 3.42 |
| Shelby | 731,554 | 8,633 | 15,101 | .......... | 755,288 | 2,343,000 | 3.10 | 863 | 152 | 182 | 261 | 1,458 | 221 | 2.34 |
| Tuscaloosa | 959,690 | 26,214 | 5,972 | 4,467 | 996,343 | 2,098,000 | 2.11 | 780 | 150 | 185 | 222 | 1,337 | 259 | 2.88 |
| Walker | 5,535,612 | 365,685 | 41,373 | .......... | 5,942,670 | 11,040,000 | 1.86 | 4,524 | 1,038 | 824 | 1,477 | 7,863 | 219 | 3.44 |
| Winston | 15,069 | 900 | 600 | .......... | 16,569 | 36,000 | 2.17 | 41 | 5 | 6 | 10 | 62 | 127 | 1.86 |
| | 19,056,904 | 550,491 | 298,833 | .......... | 20,004,395 | 42,442,000 | 2.12 | 15,596 | 3,251 | 3,792 | 4,458 | 27,097 | 246 | 3.00 |

## PRODUCERS

### BIBB COUNTY

| *Companies* | *Seams* |
|---|---|
| Alabama Blocton Coal Co. | Blocton No. 2 (drifts 1, 2, 3 and 4)<br>Blocton No. 3<br>Blocton No. 7 |
| Bessemer Coal, Iron & Land Co. | Belle Ellen Nos. 2, 5 and 12 |
| Blocton-Cahaba Coal Co. | Coleanor |
| Blocton Export Coal Co. | Tyco |
| Blocton Mining Co. | Klondyke Shaft |
| Clifton, J. H. | No. 4 Slope |
| Continental Coal Co. | Belle Ellen No. 12 |
| Hills Creek Mining Co. | Hills Creek No. 2<br>Hills Creek No. 1 |
| Little Cahaba Coal Co. | Piper No. 1<br>Piper No. 2 |
| Masena Cahaba Coal Co. | Belle Ellen No. 8 |
| Moffat Coal Co. | Dixie |
| Red Feather Coal Co. | Red Feather |
| Roden Coal Co. | Marvel Nos. 1, 2 and 3 |
| Tennessee Coal, Iron & Railroad Co. | Blocton No. 10 |

### BLOUNT COUNTY

| | |
|---|---|
| Lehigh Coal Co. | Lehigh No. 1 |
| Moss & McCormack | Carbon, Nyota |
| Phillips, J. M. | Blount |
| Shirley, T. G., Coal Co. | Taits Gap |
| Youngstown Mining Co. | Armstead |

### ETOWAH COUNTY

| | |
|---|---|
| Gulf States Steel Co. | Altoona Drift Nos. 1 and 2<br>Vanzandt |
| Raccoon Coal Co. | No. 4<br>Vanzandt |
| Sligo Coal Mining Co. | Sligo |

### FAYETTE COUNTY

| | |
|---|---|
| Moss & McCormack | Howard |

## JEFFERSON COUNTY

| *Companies* | *Seams* |
|---|---|
| Alabama By-Product Corp. | Arcadia |
| | Banner |
| | Bradford |
| | Dixianna No. 4 |
| | Majestic |
| | Mineral Springs |
| | New Pratt |
| | Praco |
| Alabama Fuel & Iron Co. | Overton Nos. 1 and 2 |
| American Fuel Co. | Black Creek |
| | Jefferson |
| Bibb, Jake | Jefferson |
| Bibby Coal, Shale & Clay Co. | Jefferson |
| Birmingham Clay Products Co. | Langley |
| Birmingham Trussville Iron Co. | Labuca |
| Birmingham Water Works Co. | No. 3 |
| Black Creek Coal & Coke Co. | Thernal |
| Black Diamond Coal Mining Co. | Apache |
| Blossburg Mining Co. | Buckeye Nos. 1 and 3 |
| Brookside-Pratt Mining Co. | Pinckney No. 1 and No. 3 |
| Cahaba Red Ash Coal Co. | Scott & Jones |
| Cahaba Valley Coal Co. | Roberson |
| Central Alabama Coal Co. | Kimberly No. 2 |
| County Coal Co. of Ala., Inc. | Bibby 1, 2, 3, 4 |
| Crescent Coal Co. | Seloca No. 2 |
| East Pratt Coal Co. | Clift |
| Etter Coal Co. | El Vista |
| Franklin Coal & Mining Co. | Powhatan |
| Flat Creek Mining Co. | North Labuca |
| Gulf States Steel Co. | Sayre and Virginia |
| H. & H. Coal Co. | Horsley |
| Henry Ellen Coal Co. | Birmingham |
| Mier-Pratt Coal Co. | Holt No. 1 |
| Montgomery Black Creek Coal Co. | Warrior |
| Neill Coal Co. | No. 6 |
| New Castle Coal Co. | New Castle Nos. 2 and 6 |
| New Found Creek Coal Co. | Eulamo |
| North Birmingham Coal Co. | O'Hare |
| North Pratt Coal Co. | Hill House |
| Porter Coal Co. | Porter |
| Ratliff, J. D. | |
| Republic Iron & Steel Co. | Sayreton, Thompson, Warner Slope No. 1 |
| Riley & Kincaid Coal Co. | Riley |
| Rogers-Talty Coal Co. | Pritchett and Watts |

| *Companies* | *Seams* |
|---|---|
| Sloss-Sheffield Steel & Iron Co. | Bessie, Blossburg Nos. 2 and 4, Lewisburg Nos. 1 and 2, Flat Top |
| Tennessee Coal, Iron & R. R. Co. | Bay View, Docena, Edgewater, Hamilton Slope, Pratt Nos. 1, 2, 3 and 7; Wylam Nos. 1, 2, 3, 4, 5, 6, 7, 8, 10 and 14. |
| Wood, P. G. | Burgin No. 4 |
| Woodward Iron Co. | Dolomite Nos. 1 and 3, Mulga |

### MARION COUNTY

| | |
|---|---|
| Brilliant Coal Co. | Brilliant |
| New River Coal Co. | Turner |

### ST. CLAIR COUNTY

| | |
|---|---|
| Alabama Fuel & Iron Co. | Acmar Nos. 1, 2, 3 and 4; Margaret Nos. 3, 4 and 5, New Acton Nos. 2 and 3 |
| Pike & Jarres | Pike |
| Seaboard Coal Mining Co. | Inman |

### SHELBY COUNTY

| | |
|---|---|
| Alabama Fuel & Iron Co. | Acton Nos. 2 and 5 |
| Eureka Coal Co. | Eureka Nos. 3 and 4 |
| Little Gem Coal Co. | Dogwood |
| Montevallo Coal Mining Co. | Montevallo |
| Montevallo-Straven Coal Co. | Straven |
| Paramount Coal Co. | Paramount |
| Peerless Cahaba Coal Co. | Peerless Cahaba |
| Premier Coal Co. | Premier No. 1 |
| Southern Coal & Coke Co. | Boothton Nos. 1, 2 and 3, Climax |
| West Helena Coal Co. | Sicard |

### TUSCALOOSA COUNTY

| | |
|---|---|
| Aetna Coal Co. | Aetna |
| Alco Coal Co. | Fleetwood |
| Big Sandy Coal & Iron Co. | Cedar Cove |
| Black Diamond Coal Mining Co. | Docneil |
| Central Iron & Coal Co. | Kellerman |
| Davis Creek Coal & Coke Co. | Rock Castle No. 3 |
| Hallman Coal Co. | Shiras No. 3 |
| Riverview Coal Co. | Rice |
| Sloss-Sheffield Steel & Iron Co. | Searles |
| Warrior-View Coal Co., Inc. | Warrior View |
| Yolande Coal & Coke Co. | Yolande No. 4 |

### WALKER COUNTY

| | |
|---|---|
| Alabama By-Product Corp. | Clipper, Dora No. 14, Gamma, Gamble, Ruby and Wegra |

| *Companies* | *Seams* |
|---|---|
| Atlas Mining Company | Atlas Pratt |
| Baker Coal Co., Inc. | Baker |
| Barney Coal Co. | Barney |
| Beechy Hollow Coal Co. | Beechy Hollow |
| Benoit Coal Mining Co. | Benoit |
| Bertha Coal Co. | Bertha |
| Borden Fuel Corp. | Borden |
| Brilliant Coal Co. | Calumet Nos. 1 and 2 |
| Brookside Pratt Mining Co. | Carbon Hill |
| Buck Coal Co. | Ballinger |
| Cedrom Coal Co. | Cedrom |
| Charlotte Coal Co. | Charlotte |
| Childers & Son, S. J. | Walker |
| Corry Coal Mining Co. | Blue Mountain |
| Daylight Coal Mining Co. | |
| DeBardeleben Coal Co. | Corona Nos. 10, 11, 12, 13, 14; Empire No. 1, Hulls, Sipsey, Townley No. 1 |
| Deepwater Coal & Iron Corp. | Big Ridge and Nauvoo Nos. 1, 2, 3, West Corona |
| Dixie Coal Mining Co. | Wabash No. 2 |
| Drewry Contracting Co., I. O. | Sunlight |
| Drifton Coal Co. | Winona |
| East Jasper Coal Co. | Walker |
| Ellis Coal Co. | Walker |
| Goodwin Coal Co. | Goodwin |
| Guthrie Bros. | Guthrie |
| Holsambake & Williams | Walker |
| Indian Head Mills of Ala. | Indian Head |
| Jones, L. | Walker |
| Kershaw Mining Co. | Cedrom |
| Manchester Coal Co. | Manchester |
| Metropolitan Coal Co. | Hillard |
| Mill Creek Coal Co. | Mill Creek |
| Moore & Mankin | Manchester No. 2 |
| Mount Carmel Coal Co. | Mount Carmel |
| Oakman Mining Company | Oakman and Tuscaloosa |
| Parrish Coal Co. | Blanton No. 2 |
| Phillips Coal Co. | Phillips (Rochelle) |
| Piedmont Coal Co. | Piedmont |
| Pratt Fuel Corp. | Marietta, Bankhead, Pratt No. 2 and No. 3, Pratt-Jagger, Red Star, Pratt Nos. 5, 6 and 7; Red Oak, Samoset, Yerkwood |
| Railway Fuel Co. | Parrish |
| River Pratt Coal Co. | River Pratt |
| Saragossa Mining Co. | Saragossa |
| Sartain-Boyer Coal Co. | Boyer |

| *Seams* | *Companies* |
|---|---|
| Shackelford Coal Mining Co. | Davis |
| Sherman Coal Co. | Atlas |
| Sipsey Coal Mining Co. | Dilworth |
| Sloss-Sheffield Steel & Iron Co. | Ivy |
| Stith Coal Co. | Stith |
| Summit Coal Co. | Summit |
| Supreme Mining Co. | Supreme No. 1 |
| Thomas Creek Coal Co. | Bymon |
| Townley Coal Co. | Lang |
| Warrior Cement Corp. | Ivy Bluff |

### WINSTON COUNTY

| | |
|---|---|
| Beulah Coal Mining Co. | Beulah |
| Cagle, W. C. | Gamble & Glen Mary |
| Deepwater Coal & Iron Corp. | Glen Mary |
| Dill, J. A. | Winston |
| Williams, J. T. | Winston |

# COKE

By F. G. Tryon and H. L. Bennit

## DEFINITIONS OF TERMS USED IN STATISTICAL TABLES

The standard unit of measurement in the coke industry in the United States is the short or net ton of 2,000 pounds; unless other notation is made, it is the unit employed throughout this chapter.

The term "coke," as used, does not include breeze or the fine coke screenings, because operators in general, especially those in the beehive industry, do not regard this fine material as properly so classified. No effort has been made to define accurately the limitation as to size between coke and breeze. Each operator has followed his own regular practice in reporting his output of fine material to the Bureau of Mines. It is probably safe to say, however, that coke breeze and screenings correspond closely in size to the anthracite usually classified as steam sizes; in other words, they include the material smaller than pea coal.

For reasons explained in a later section, the statistics of by-product coke in this report cover the operations of all by-product coke ovens, including those installed and operated by public utilities engaged primarily in manufacturing gas for city supply.

*Beehive and by-product coke.*—Neither petroleum coke nor gas-house coke is adapted for metallurgical purposes, the use that consumes the great bulk of all the coke produced. Practically, therefore, the coke trade is concerned only with beehive coke and by-product coke, and to them the statistics of this report are confined. Although their product is interchangeable, there are fundamental differences between the beehive and by-product industries which must be kept in mind in examining the tables of this chapter. The competitive relations between the beehive and by-product industries have been discussed in previous reports of this series and need not be treated here. Permanently higher prices for coal and gradually expanding markets for the by-products continue to foster the development of by-product coking, and the manufacture of beehive coke assumes more and more the character of an auxiliary agency called upon to furnish only the peak requirements of the metallurgical industry in times of active business.

## *Coke produced in by-product and beehive coke ovens in the United States, 1924-25*

(Exclusive of screenings and breeze)

| State | By-product | | | | | | | | Beehive | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Plants | Ovens | | Coal used (net tons) | Yield of coke from coal (per cent) | Coke produced (net tons) | Value of coke at ovens | | Ovens | Coal used (net tons) | Yield of coke from coal (per cent) | Coke produced (net tons) | Value of coke at ovens | | Coke produced (net tons) | Value of coke at ovens |
| | | Built | Under construction Dec. 31 | | | | Total | Per ton | | | | | Total | Per ton | | |
| 1924 | | | | | | | | | | | | | | | | |
| Alabama | 7 | 1,196 | 25 | 6,375,171 | | 4,386,372 | $16,563,223 | $3.78 | 6,199 | 256,240 | 60.4 | 154,686 | $840,843 | $5.44 | 4,541,058 | $17,404,066 |
| Colorado | 1 | 120 | ---- | 754,790 | 69.3 | 523,405 | * | * | 1,696 | 330,226 | 64.2 | 212,115 | * | * | 735,520 | * |
| Georgia | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 151 | 14,400 | 56.1 | 8,081 | 71,355 | 8.83 | 8,081 | 71,355 |
| Illinois | 7 | 739 | 110 | 3,397,248 | 69.3 | 2,355,474 | 20,187,519 | 8.57 | ---- | ---- | ---- | ---- | ---- | ---- | 2,355,474 | 20,187,519 |
| Indiana | 6 | 1,133 | 19 | 5,828,314 | 73.3 | 4,272,435 | 30,394,497 | 7.11 | ---- | ---- | ---- | ---- | ---- | ---- | 4,272,435 | 30,394,497 |
| Kentucky | 1 | 108 | ---- | ** | ** | ** | ** | ** | 795 | 146,794 | 54.0 | 79,248 | * | * | ** | ** |
| Maryland | 1 | 300 | ---- | 1,103,984 | 73.4 | 810,118 | * | * | ---- | ---- | ---- | ---- | ---- | ---- | 810,118 | * |
| Massachusetts | 1 | 400 | 11 | 574,632 | 69.2 | 397,640 | * | * | ---- | ---- | ---- | ---- | ---- | ---- | 397,640 | * |
| Michigan | 5 | 420 | 2 | 2,408,925 | 73.5 | 1,770,547 | 11,914,028 | 6.73 | ---- | ---- | ---- | ---- | ---- | ---- | 1,770,547 | 11,914,028 |
| Minnesota | 3 | 220 | ---- | 744,567 | 69.1 | 514,764 | 4,903,891 | 9.53 | ---- | ---- | ---- | ---- | ---- | ---- | 514,764 | 4,903,891 |
| Missouri | 1 | 64 | ---- | ** | ** | ** | ** | ** | ---- | ---- | ---- | ---- | ---- | ---- | ** | ** |
| New Jersey | 2 | 202 | ---- | 1,202,732 | 72.3 | 869,120 | ** | * | ---- | ---- | ---- | ---- | ---- | ---- | 869,120 | * |
| New Mexico | ---- | ---- | ---- | ---- | ---- | | | | 1,030 | 136,212 | 61.0 | 83,070 | * | * | 83,070 | * |
| New York | 5 | 686 | 55 | 2,265,062 | 70.7 | 1,600,669 | 11,108,944 | 6.94 | ---- | ---- | ---- | ---- | ---- | ---- | 1,600,669 | 11,108,944 |
| Ohio | 14 | 1,689 | ---- | 8,422,760 | 67.9 | 5,723,074 | 31,008,209 | 5.42 | 205 | 168,648 | 65.0 | 109,625 | * | * | 5,832,699 | * |
| Oklahoma | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 300 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Pennsylvania | 11 | 3,420 | 25 | 12,555,567 | 67.1 | 8,426,155 | 34,674,512 | 4.12 | 36,030 | 12,989,648 | 65.4 | 8,501,282 | 37,893,584 | 4.46 | 16,927,437 | 72,568,096 |
| Rhode Island | 1 | 40 | ---- | ** | ** | ** | ** | ** | ---- | ---- | ---- | ---- | | | ** | ** |
| Tennessee | 1 | 24 | ---- | 103,314 | 73.3 | 75,720 | 376,328 | 4.97 | 1,555 | 249,293 | 52.9 | 131,755 | 635,736 | 4.83 | 207,475 | 1,012,064 |
| Utah | 1 | 33 | ---- | 190,035 | 51.2 | 97,350 | * | * | 819 | 268,808 | 59.4 | 159,744 | 1,310,929 | 8.21 | 257,094 | * |
| Virginia | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 3,234 | 769,990 | 63.0 | 485,064 | 2,343,081 | 4.83 | 485,064 | 2,343,081 |
| Washington | 1 | 20 | ---- | 70,968 | 56.2 | 39,903 | 283,710 | 7.11 | 408 | 49,339 | 64.3 | 31,712 | 289,934 | 9.14 | 71,615 | 573,644 |
| West Virginia | 4 | 311 | ---- | 1,484,951 | 67.3 | 998.914 | 4,402,186 | 4.41 | 8,010 | 534,712 | 61.7 | 329,655 | 1,646,452 | 4.99 | 1,328,569 | 6,048,638 |
| Wisconsin | 2 | 288 | ---- | ** | ** | ** | ** | ** | ---- | ---- | ---- | ---- | ---- | ---- | ** | ** |
| Combined States | ---- | ---- | ---- | 1,578,318 | 71.1 | 1,121,908 | 9,387,943 | 8.37 | ---- | ---- | ---- | ---- | ---- | ---- | 1,201,156 | 9,843,475 |
| Undistributed | ---- | ---- | ---- | ---- | ---- | ---- | 20,485,019 | 7.59 | ---- | ---- | ---- | ---- | 3,319,638 | 6.86 | ---- | 55,668,263 |
| | 75 | 11,413 | 247 | 49,061,339 | 69.3 | 33,983,568 | 195,690,009 | 5.76 | 60,432 | 15,914,310 | 64.6 | 10,286,037 | 18,351,552 | 4.70 | 44,269,605 | 244,041,561 |

*Included under "Undistributed."

**Included under "Combined States."

*Coke produced in by-product and beehive coke ovens in the United States, 1924-25*—(Continued)

(Exclusive of screenings and breeze)

| State | By-product | | | | | | | | Beehive | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Plants | Ovens | | Coal used (net tons) | Yield of coke from coal (per cent) | Coke produced (net tons) | Value of coke at ovens | | Ovens | Coal used (net tons) | Yield of coke from coal (per cent) | Coke produced (net tons) | Value of coke at ovens | | Coke produced (net tons) | Value of coke at ovens |
| | | Built | Under construction Dec. 31 | | | | Total | Per ton | | | | | Total | Per ton | | |
| 1925 | | | | | | | | | | | | | | | | |
| Alabama | 8 | 1,276 | | 6,516,689 | 70.3 | 4,582,153 | $16,347,971 | $3.57 | 4,961 | 137,106 | 64.4 | 88,328 | $ 453,870 | $5.14 | 4,670,481 | $16,801,841 |
| Colorado | 1 | 120 | | 706,948 | 69.3 | 489,657 | * | * | 1,681 | 239,004 | 64.8 | 154,824 | * | * | 644,481 | * |
| Georgia | | | | | | | | | 151 | 8,651 | 56.9 | 4,925 | 38,464 | 7.81 | 4,925 | 38,464 |
| Illinois | 7 | 849 | | 4,224,420 | 71.3 | 3,011,497 | 22,568,845 | 7.49 | | | | | | | 3,011,497 | 22,568,845 |
| Indiana | 7 | 1,177 | 212 | 6,866,855 | 74.9 | 5,141,940 | 36,635,104 | 7.12 | | | | | | | 5,141,940 | 36,635,104 |
| Kentucky | 1 | 108 | | ** | ** | ** | ** | ** | 795 | ** | ** | ** | ** | ** | ** | ** |
| Maryland | 1 | 300 | | 1,383,344 | 73.4 | 1,019,209 | * | * | | | | | | | 1,019,209 | * |
| Massachusetts | 2 | 419 | | 797,699 | 67.1 | 535,302 | * | * | | | | | | | 535,302 | * |
| Michigan | 5 | 420 | 2 | 2,450,275 | 71.5 | 1,751,118 | 11,708,519 | 6.69 | | | | | | | 1,751,118 | 11,708,519 |
| Minnesota | 3 | 220 | | 791,992 | 65.4 | 518,355 | 4,992,024 | 9.63 | | | | | | | 518,355 | 4,992,024 |
| Missouri | 1 | 64 | | ** | ** | ** | ** | ** | | | | | | | ** | ** |
| New Jersey | 2 | 206 | | 1,242,275 | 72.8 | 903,997 | * | * | | | | | | | 903,997 | * |
| New Mexico | | | | | | | | | 1,030 | ** | ** | ** | ** | ** | ** | ** |
| New York | 6 | 506 | 155 | 3,074,465 | 72.2 | 2,219,409 | 12,968,066 | 5.84 | | | | | | | 2,219,409 | 12,968,066 |
| Ohio | 14 | 1,689 | | 10,336,068 | 68.7 | 7,105,129 | 34,190,691 | 4.81 | 204 | 240,828 | 64.8 | 156,058 | * | * | 7,261,187 | * |
| Oklahoma | | | | | | | | | 300 | | | | | | | |
| Pennsylvania | 12 | 3,220 | 60 | 14,679,836 | 67.1 | 9,853,262 | 34,518,863 | 3.50 | 34,668 | 14,572,282 | 65.7 | 9,574,341 | 41,875,615 | 4.37 | 19,427,603 | 76,394,478 |
| Rhode Island | 1 | 40 | | ** | ** | ** | ** | ** | | | | | | | ** | ** |
| Tennessee | 1 | 24 | | 125,860 | 70.6 | 88,879 | 471,059 | 5.30 | 1,675 | 200,373 | 63.7 | 127,609 | 690,041 | 5.40 | 216,488 | 1,161,100 |
| Utah | 1 | 33 | | 316,285 | 53.2 | 168,150 | * | * | 819 | 247,473 | 59.0 | 146,009 | 1,240,256 | 8.49 | 314,159 | * |
| Virginia | | | | | | | | | 3,124 | 661,193 | 63.8 | 421,691 | 1,901,623 | 4.51 | 421,691 | 1,901,623 |
| Washington | 1 | 20 | | 68,655 | 59.3 | 40,757 | 289,782 | 7.11 | 332 | 62,644 | 61.5 | 38,500 | 327,483 | 8.51 | 79,257 | 617,265 |
| West Virginia | 4 | 311 | | 1,526,820 | 69.2 | 1,055,992 | 4,479,866 | 4.24 | 7,847 | 804,055 | 60.9 | 490,040 | 2,168,879 | 4.43 | 1,546,032 | 6,648,745 |
| Wisconsin | 2 | 288 | | ** | ** | ** | ** | ** | | | | | | | ** | ** |
| Combined States | | | | 2,001,165 | 71.3 | 1,427,353 | 10,555,681 | 7.39 | | 248,972 | 61.2 | 152,459 | 1,004,350 | 6.59 | 1,579,812 | 11,560,031 |
| Undistributed | | | | | | | 21,101,100 | 6.77 | | | | | 2,030,985 | 6.53 | | 58,563,032 |
| | 80 | 11,290 | 429 | 57,109,651 | 69.9 | 39,912,159 | 210,827,571 | 5.28 | 57,587 | 17,422,581 | 65.2 | 11,354,784 | 51,731,566 | 4.56 | 51,266,943 | 262,559,137 |

*Included under "Undistributed."

**Included under "Combined States."

*By-product and beehive coke produced in the United States, 1918 and 1921-1925, in net tons*

| State | 1918 | 1921 | 1922 | 1923 | 1924 | 1925 |
|---|---|---|---|---|---|---|
| BY-PRODUCT | | | | | | |
| Alabama | 2,634,451 | 2,401,127 | 3,493,656 | 4,385,366 | 4,386,372 | 4,582,153 |
| Colorado | 230,663 | 286,755 | 364,678 | 448,243 | 523,405 | 489,657 |
| Illinois | 2,285,610 | 1,322,178 | 1,982,906 | 3,187,268 | 2,355,474 | 3,011,497 |
| Indiana | 3,898,215 | 3,091,263 | 3,905,505 | 5,042,614 | 4,272,435 | 5,141,940 |
| Kentucky | 517,749 | 185,383 | 456,645 | 434,116 | * | * |
| Maryland | 474,368 | 292,439 | 589,893 | 861,668 | 810,118 | 1,019,209 |
| Massachusetts | 556,397 | 294,059 | 407,081 | 554,125 | 397,640 | 535,302 |
| Michigan | * | 777,125 | 1,142,059 | 1,648,773 | 1,770,547 | 1,751,118 |
| Minnesota | 784,065 | 435,866 | 462,044 | 695,824 | 514,764 | 518,355 |
| Missouri | * | * | * | * | * | * |
| New Jersey | 682,148 | 739,768 | 790,811 | 897,569 | 869,120 | 903,997 |
| New York | 1,069,587 | 746,916 | 1,494,992 | 1,783,948 | 1,600,669 | 2,219,409 |
| Ohio | 5,226,334 | 2,966,273 | 4,911,670 | 6,323,810 | 5,723,074 | 7,105,129 |
| Pennsylvania | 4,586,981 | 5,303,371 | 7,151,912 | 9,185,747 | 8,426,155 | 9,853,262 |
| Rhode Island | ---------- | * | * | * | * | * |
| Tennessee | 124,469 | 57,723 | 27,454 | 124,160 | 75,720 | 88,879 |
| Utah | ---------- | ---------- | ---------- | ---------- | 97,350 | 168,150 |
| Washington | 30,129 | 23,765 | 5,611 | 31,081 | 39,903 | 40,757 |
| West Virginia | 603,393 | 188,355 | 501,894 | 940,866 | 998,914 | 1,055,992 |
| Wisconsin | * | * | * | * | * | * |
| Combined States | 2,293,021 | 637,214 | 771,734 | 1,052,586 | 1,121,908 | 1,427,353 |
| | 25,997,580 | 19,749,580 | 28,550,545 | 37,597,664 | 33,983,568 | 39,912,159 |
| BEEHIVE | | | | | | |
| Alabama | 1,717,721 | 132,912 | 306,209 | 268,709 | 154,686 | 88,328 |
| Colorado | 758,784 | 81,376 | 119,361 | 199,580 | 212.115 | 154,824 |
| Georgia | 22,048 | 6,943 | 8,832 | 12,556 | 8,081 | 4,925 |
| Kentucky | 301,036 | 99,442 | 30,522 | 125,595 | 79,248 | * |
| New Mexico | 597,072 | * | 87,631 | * | 83,070 | * |
| Ohio | 138,909 | 62,150 | 99,468 | 149,796 | 109,625 | 156,058 |
| Oklahoma | * | ---------- | ---------- | * | ---------- | ---------- |
| Pennsylvania | 22,136,664 | 4,466,105 | 6,839,980 | 16,438,539 | 8,501,282 | 9,574,341 |
| Tennessee | 302,637 | 28,005 | 86,442 | 180,351 | 131,755 | 127,609 |
| Utah | * | * | 172,453 | 232,941 | 159,744 | 146,009 |
| Virginia | 1,234,256 | 280,476 | 378,656 | 774,887 | 485,064 | 421,691 |
| Washington | 93,659 | 3,495 | 26,063 | 37,987 | 31,712 | 38,500 |
| West Virginia | 2,716,613 | 209,537 | 417,850 | 821,909 | 329,655 | 490,040 |
| Combined States | 461,393 | 167,601 | ---------- | 137,020 | ---------- | 152,459 |
| | 30,480,792 | 5,538,042 | 8,573,467 | 19,379,870 | 10,286,037 | 11,354,784 |

*Included under "Combined States."

*Rank of the States in the production of coke, 1291-1925*

| State | 1921 | | 1922 | | 1923 | | 1924 | | 1925 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | All coke | By-product | All coke | By-product | All coke | By-product | All coke | By-product coke | coke | By-product coke |
| Pennsylvania | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ohio | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Indiana | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 3 |
| Alabama | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 |
| Illinois | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| New York | 7 | 7 | 6 | 6 | 6 | 6 | 7 | 7 | 6 | 6 |
| Michigan | 6 | 6 | 7 | 7 | 8 | 7 | 6 | 6 | 7 | 7 |
| West Virginia | 10 | 15 | 8 | 10 | 7 | 8 | 8 | 8 | 8 | ------- |
| Maryland | 14 | 12 | 10 | 9 | 10 | 10 | 10 | 10 | 9 | 9 |
| New Jersey | 8 | 8 | 9 | 8 | 9 | 9 | 9 | 9 | 10 | 10 |
| Colorado | 11 | 13 | 12 | 15 | 13 | 14 | 11 | 11 | 11 | 15 |
| Kentucky | 15 | 16 | 11 | 12 | 15 | 15 | 16 | 15 | 12 | 14 |
| Wisconsin | 12 | 10 | 14 | 13 | 14 | 12 | 14 | 13 | 13 | 11 |
| Massachusetts | 13 | 11 | 15 | 14 | 16 | 13 | 15 | 14 | 14 | 12 |
| Minnesota | 9 | 9 | 13 | 11 | 12 | 11 | 12 | 12 | 15 | 13 |
| Virginia | 16 | ------- | 16 | ------- | 11 | ------- | 13 | ------- | 16 | ------- |
| Utah | 18 | ------- | 18 | ------- | 19 | ------- | 17 | 18 | 17 | 17 |
| Missouri | 17 | 14 | 17 | 16 | 18 | 16 | 18 | 16 | 18 | 16 |
| Tennessee | 20 | 18 | 20 | 18 | 17 | 18 | 19 | 19 | 19 | 19 |
| Rhode Island | 19 | 17 | 19 | 17 | 20 | 17 | 20 | 17 | 20 | 18 |
| Washington | 21 | 19 | 22 | 19 | 22 | 19 | 22 | 20 | 21 | 20 |
| New Mexico | 22 | ------- | 21 | ------- | 21 | ------- | 21 | ------- | 22 | ------- |
| Georgia | 23 | ------- | 23 | ------- | 23 | ------- | 23 | ------- | 23 | ------- |
| Oklahoma | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |

## NUMBER AND TYPE OF OVENS

*By-product coke ovens built and under construction in Alabama at end of each year, 1922-1925*

| | | | |
|---|---|---|---|
| 1922— | | 1924— | |
| Built | 1,196 | Built | 1,196 |
| Under construction | ------- | Under construction | 25 |
| 1923— | | 1925— | |
| Built | 1,196 | Built | 1,276 |
| Under construction | ------- | Under construction | ------- |

## *Beehive coke ovens in Alabama at the end of each year, 1920-1925*

| | | | |
|---|---|---|---|
| 1920 | 8,482 | 1923 | 6,199 |
| 1921 | 6,177 | 1924 | 6,199 |
| 1922 | 6,460 | 1925 | 4,961 |

## *By-product coke plants in Alabama, December 31, 1925*

| Town | Name of company owning plant | Type of plant* | Number of ovens | Type of oven | Year put in operation** |
|---|---|---|---|---|---|
| Alabama City | Gulf States Steel Co. | F | 37 | Koppers | 1917 |
| Ensley | Semet-Solvay Co. | F | 240 | Semet-Solvay | 1898-1902 |
| Fairfield | Tennessee Coal, Iron & R. R. Co. | F | 434 | Koppers | 1912-1920 |
| North Birmingham | Sloss-Sheffield Steel & Iron Co. | F | 120 | Semet-Solvay | 1920 |
| Tarrant | Alabama By-Products Corp. | M | 100 | Koppers | 1920-1925 |
| Thomas | Republic Iron & Steel Co. | F | 57 | do | 1925 |
| Tuscaloosa | Central Iron & Coal Co. | F | 60 | Semet-Solvay | 1906-1914 |
| Woodward | Woodward Iron Co. | F | 60 | Koppers | 1911-1922 |
| do | do | F | 168 | Wilputte | 1917 |

F, "Furnace plants," or plants associated with iron furnaces and steel works. M, "Nonfurnace plants" or "other plants," including merchant plants, plants associated with industries other than iron and steel, and plants supplying gas under contract for city use.

**The first and last years are given for those plants that have two or more installations.

## *Coke ovens in Alabama completed and abandoned and total number in existence and under construction at the end of 1925*

| | Plants in existence | Ovens | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | New* | | Abandoned during year | | | Under construction Dec. 31 | |
| | | Number | Capacity per day (net tons of coke) | | Number | Capacity per day (net tons of coke | Number | Capacity per day (net tons of coke) |
| BY-PRODUCT | 8 | 82 | 1,390 | 2 | 1,276 | 14,450 | ------ | ------ |
| BEEHIVE | 18 | | | 1,358 | 4,961 | ------ | ------ | ------ |

*Represents new construction. Does not include ovens repaired and put into commission.

### *By-product ovens of each type in Alabama at the end of the year in 1924 and 1925*

| | 1924 | 1925 |
|---|---|---|
| Koppers* | 716 | 796 |
| Semet-Solvay | 420 | 420 |
| Wilputte | 60 | 60 |
| Total | 1,196 | 1,276 |

*Includes the Koppers-Becker type.

### *Total quantity and value at ovens of coal used in the manufacture of coke in Alabama, 1924 and 1925*

| State | Coal used (net tons) | Cost of coal | | Coal per ton of coke | |
|---|---|---|---|---|---|
| | | Total | Per ton of coal | Net tons | Cost |
| 1924 | | | | | |
| By-product plants | 6,375,171 | $18,172,290 | $2.85 | 1.45 | $4.13 |
| Beehive plants | 256,240 | 670,800 | 2.62 | 1.66 | 4.35 |
| 1925 | | | | | |
| By-product plants | 6,516,689 | 17,487,682 | 2.68 | 1.42 | 3.81 |
| Beehive plants | 137,106 | 364,318 | 2.66 | 1.55 | 4.12 |

### *Average cost per net ton of coal charged into by-product coke ovens, in Alabama, 1916-1925*

| | | | |
|---|---|---|---|
| 1916 | $1.89 | 1921 | $3.29 |
| 1917 | $2.54 | 1922 | $2.47 |
| 1918 | $3.29 | 1923 | $2.95 |
| 1919 | $3.35 | 1924 | $2.85 |
| 1920 | $4.10 | 1925 | $2.68 |

## PREPARATION AND SOURCE OF COAL CHARGED

*Coal used in the manufacture of by-product and beehive coke in Alabama, 1922-1925, in net tons*

| State | 1922 | 1923 | 1924 | 1925 | | |
|---|---|---|---|---|---|---|
| | | | | Unwashed | Washed | Total |
| By-product ovens | 5,115,981 | 6,408,843 | 6,375,171 | 509,661 | 464,160 | 256,240 |
| Beehive ovens | 129,437 | 6,387,252 | 6,516,689 | ------------ | 137,106 | 137,106 |

*Coal consumed at beehive-coke plants in Alabama, 1924-1925, classified with respect to practice in crushing coal before charging, in net tons*

| | At plants practicing crushing* | At plants not practicing crushing Total | Total |
|---|---|---|---|
| 1924 | 187,781 | 68,459 | 256,240 |
| 1925 | 66,539 | 70,567 | 137,106 |

## YIELD OF COKE PER TON OF COAL

*Percentage yield of coke from coal in by-product and beehive ovens in Alabama, 1922-1925*

| | By-product | Beehive |
|---|---|---|
| 1922 | 68.3 | 60.1 |
| 1923 | 68.4 | 57.9 |
| 1924 | 68.8 | 60.4 |
| 1925 | 70.3 | 64.4 |

*Coke breeze recovered at by-product ovens in Alabama, 1924 and 1925*

| | 1924 | 1925 |
|---|---|---|
| Yield (per cent of coal) | 4.2 | 4.0 |
| Net tons produced | 265,799 | 263,518 |
| Value | $439,013 | $545,006 |
| Used for steam raising: | | |
| Net tons | 122,695 | 180,900 |
| Value | $225,896 | $353,033 |
| Used for other purposes by producer— | | |
| Net tons | 56,456 | 12,026 |
| Value | $96,501 | $22,615 |
| Sold, net tons | 33,197 | 65,591 |
| Value | $83,898 | $154,977 |
| Put in stock, net tons | 58,838 | 16,709 |
| Wasted, net tons | 34,234 | 11,142 |

## DISPOSAL, SALES AND STOCKS

*By-product and beehive coke produced in Alabama and sold or used by the producer, 1924 and 1925 (exclusive of screenings and breeze), with average values per ton*

| | Net tons | | Value (dollars) | | Per ton | |
|---|---|---|---|---|---|---|
| BY-PRODUCT | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 |
| Total production | 4,386,372 | 4,582,153 | 16,563,223 | 16,347,971 | 3.77 | 3.57 |
| Sold, total | 506,130 | 543,233 | 2,501,490 | 2,446,343 | 4.94 | 4.50 |
| Furnaces: | | | | | | |
| Affiliated Corporations | 44,964 | 22,190 | 230,432 | 130,921 | 5.12 | 5.90 |
| Merchant sales | 13,784 | 14,889 | 64,291 | 74,445 | 4.66 | 5.00 |
| Foundries | 295,932 | 315,373 | 1,535,410 | 1,487,694 | 5.19 | 4.72 |
| Domestic use | 57,663 | 109,681 | 255,864 | 445,972 | 4.44 | 4.07 |
| Industrial and other uses | 93,787 | 81,100 | 415,493 | 307,311 | 4.43 | 3.79 |
| Used by producer in blast furnaces, etc. | 3,888,760 | 4,073,648 | 14,137,294 | 13,980,116 | 3.64 | 3.44 |
| BEEHIVE | | | | | | |
| Total production | 154,686 | 88,328 | 840,843 | 453,870 | 5.44 | 5.14 |
| Sold, total | 90,898 | 64,051 | 486,171 | 332,983 | 5.35 | 5.20 |
| Furnaces (Affiliated Corporations) | 19,316 | ---------- | 108,503 | ---------- | 5.62 | ------ |
| Foundries | 33,437 | 32,918 | 189,698 | 184,212 | 5.67 | 5.60 |
| Industrial and other uses | 38,145 | 31,133 | 187,970 | 148,771 | 4.93 | 4.78 |
| Used by producer, in blast furnaces, etc. | 62,796 | 24,184 | 349,188 | 120,527 | 5.56 | 5.00 |

The value of all coke produced in Alabama in 1925, exclusive of screenings and breeze, was $16,801,841, as compared with $17,404,066 in 1924, representing a decrease of $602,225, or 3.6% (1.3% for by-product and 46% for beehive coke).

## PRODUCTION OF COKE, IN ALABAMA, 1880-1925 (Net Tons)

| Year | Tons | Year | Tons | Year | Tons |
|---|---:|---|---:|---|---:|
| 1880 | 60,781 | 1896 | 1,479,437 | 1912 | 2,975,489 |
| 1881 | 109,033 | 1897 | 1,443,017 | 1913 | 3,323,664 |
| 1882 | 152,940 | 1898 | 1,663,020 | 1914 | 3,084,149 |
| 1883 | 217,531 | 1899 | 1,787,809 | 1915 | 3,071,811 |
| 1884 | 244,009 | 1900 | 2,110,837 | 1916 | 4,298,417 |
| 1885 | 301,180 | 1901 | 2,148,911 | 1917 | 4,892,589 |
| 1886 | 375,054 | 1902 | 2,552,246 | 1918 | 4,352,172 |
| 1887 | 325,020 | 1903 | 2,693,497 | 1919 | 3,380,771 |
| 1888 | 508,511 | 1904 | 2,340,219 | 1920 | 4,013,891 |
| 1889 | 1,030,510 | 1905 | 2,576,986 | 1921 | 2,534,039 |
| 1890 | 1,072,942 | 1907 | 3,021,794 | 1922 | 3,799,865 |
| 1891 | 1,282,496 | 1906 | 3,034,501 | 1923 | 4,654,075 |
| 1892 | 1,501,571 | 1908 | 2,362,666 | 1924 | 4,541,058 |
| 1893 | 1,168,085 | 1909 | 3,085,824 | 1924 | 4,541,058 |
| 1894 | 923,817 | 1910 | 3,249,027 | 1925 | 4,670,481 |
| 1895 | 1,444,339 | 1911 | 2,761,521 | | |

## BEEHIVE COKE PRODUCERS

Alabama By-Products Corp., Birmingham, Ala. Works at Dixiana.

Black Creek Coal and Coke Co.

U. S. Cast Iron Pipe & Foundry Co., Bessemer, Ala. Works at Bessemer, Jefferson County.

Yolande Coal & Coke Co., Birmingham, Ala. Works at Yolande and New Connellsville, Tuscaloosa County.

## BY-PRODUCT COKE PRODUCERS

Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala. Works at Alabama City, Etowah County.

Semet-Solvay Co., Syracuse, N. Y. Works at Ensley, Jefferson County, and Tolt, Tuscaloosa County.

Tennessee Coal, Iron & R. R. Co., Birmingham, Ala. Works at Fairfield, Jefferson County.

Woodward Iron Co., Woodward, Ala. Works at Woodward, Jefferson County.

Sloss-Sheffield Steel and Iron Co., Hugh Morrow, President, Birmingham, Ala. Plant at North Birmingham.

Alabama By-Products Corporation, Birmingham, Ala. Plant at Tarrant City.

Republic Iron and Steel Co., Birmingham, Ala. Plant at Thomas.

# GRAPHITE

### By JEFFERSON MIDDLETON*

## INTRODUCTION

In 1925 the graphite industry in the United States declined on the whole, although the number of States reporting, the number of operators, and the value of the output were all larger than in 1924. No new developments of any consequence were reported. In Alabama, which at one time was the largest producer of crystalline graphite, production has virtually ceased. Nearly all of the 30 plants that were in operation there in 1918 have been abandoned or dismantled, and only one operator reported sales in 1925. In New York, formerly a large producer, operations have ceased entirely. In Texas the producing company reports that its plant is working 20 hours a day, and its highly standardized uniform product is finding a ready market. Montana re-entered the list of producing States in 1925 with a small output of high-grade graphite. The chief reason for the decline in the crystalline graphite industry in the United States is the inability of the domestic producer to compete successfully with the high-grade foreign product by cheap labor, though the prejudice of consumers against domestic graphite no doubt has been an important factor in the present condition of the industry.

The price of imported graphite continued high throughout 1925 and will probably remain high because of the exhaustion of stocks and the increased cost of new production in the foreign fields. The high price of imported graphite is shown by the fact that though the quantity imported in 1925 increased 9 per cent, its value increased 107 per cent compared with 1924. The production of artificial graphite increased 10 per cent in 1925 compared with 1924.

The Engineering and Mining Journal-Press of May 1, 1926, page 734, in reply to an inquiry as to the quality of the graphite listed in its quotations, published the following:

> There are no exact standards for these different grades and classifications, nor is one product used for a given purpose to the exclusion of all others. However, the following data * * * should give a general idea of the situation:
>
> 1. Ceylon lump is a sorted product and usually contains about 90 per cent graphitic carbon. Chip ranges around 80 per cent, and dust about 70 per cent.

---

*Figures on imports and exports were compiled by J. A. Dorsey, of the Bureau of Mines, from records of the Bureau of Foreign and Domestic Commerce.

2. The bulk of Ceylon lump and chip is used for crucible manufacture. Other uses are lubricants, pencils and paint, foundry facings, stove polish, electrodes and brushes for the electric industry, fillers for dry batteries, and steam-boiler mixtures.

3. "Crude amorphous" is not suitable for crucible manufacture, but will do for the other purposes mentioned above. The most important use from the standpoint of quantity is for foundry facings.

4. Lubricating graphite obviously must be free from grit or the bearings would be injured. It may be of actually higher grade than crucible graphite, or it may be of lower grade; but the impurities must not be abrasive. Preparations designed for lubrication sometimes are used for other purposes, but probably not in large quantity. The grades No. 1 and No. 2 refer to the size of the flakes but the value does not necessarily depend on this feature. The selection of flake size is often a matter of taste.

5. In these grades (extra fine ground, medium fine ground, and facings) the graphitic carbon content may be as low as 40 or 45 per cent for many purposes.

Foundry facings need not be ground particularly fine; but for some uses the product must be so well pulverized that 99 per cent will pass a 200-mesh screen.

The uses (of these grades) are those already enumerated, excepting, of course, the making of crucibles.

The raw material may be imported or domestic crystalline or amorphous. Amorphous or Ceylon dust is generally preferred for foundry facings, though ground flake also is used.

## USES

Natural graphite is used chiefly in the manufacture of foundry facings, pigments and paints, crucibles, pencils and crayons, and commutator brushes. The following table was compiled by the United States Tariff Commission as the result of an investigation to determine the consumption by uses of graphite in the United States, and it is published with the consent of the commission. The data cover the operations of 27 of the 30 known manufacturers of graphite products. The three that gave no information are of minor importance and their omission is believed not to affect materially the results. The distribution of the various uses shown in the table involves estimates that were based on well-determined factors and may be considered accurate within fairly close limits. Contrary to general opinion the use of graphite in the manufacture of crucibles in the years covered by the investigation was comparatively small. Only 15 per cent of the consumption for finished products went to this use in 1923 and 13 per cent in 1924. Foundry facings consumed the largest proportion—44 per cent in 1923 and 52 per cent in 1924. Pigments and paints were second in the quantity of graphite consumed—16 per cent in 1923 and 18 per cent in 1924.

The manufacturers of pencils and crayons and of commutator brushes ranked fourth and fifth as consumers of graphite, each taking 9 per cent in 1923 and 5 per cent in 1924. These five products used 91 per cent of the total in 1923 and 93 per cent of it in 1924. Only three uses, all minor, showed increases in 1924 as compared with 1923. Graphite for bearings and bushings and for lubricants commands the highest prices.

*Graphite consumed in the United States, 1923 and 1924, by uses (stocks on hand neglected)*

| Use | 1924 | | | 1923 | | |
|---|---|---|---|---|---|---|
| | Short tons | Value | | Short tons | Value | |
| | | Total | Cents per pound | | Total | Cents per pound |
| Finished product: | | | | | | |
| Facings | 14,633 | $854,988 | 2.9 | 13,924 | $763,757 | 2.7 |
| Pigments and paints | 5,256 | 286,597 | 2.7 | 4,875 | 281,933 | 2.9 |
| Crucibles— | | | | | | |
| Brass | 3,414 | 377,522 | 5.5 | 2,830 | 315,896 | 5.6 |
| Steel | 1,517 | 240,203 | 7.9 | 629 | 92,433 | 7.3 |
| Pencils and crayons | 2,965 | 156,992 | 2.6 | 1,416 | 67,738 | 2.4 |
| Commutator brushes | 2,867 | 149,794 | 2.6 | 1,313 | 62,732 | 2.4 |
| Stove polish | 760 | 45,228 | 3.0 | 406 | 19,134 | 2.4 |
| Lubricants | 538 | 136,505 | 12.7 | 365 | 105,623 | 14.5 |
| Retorts | 344 | 30,229 | 4.4 | 291 | 22,532 | 3.9 |
| Bearings and bushings | 448 | 116,261 | 13.0 | 282 | 84,723 | 15.0 |
| Shot and powder polish | 95 | 5,289 | 2.8 | 104 | 6,110 | 2.9 |
| Roof dust | 84 | 4,862 | 2.9 | 90 | 5,215 | 2.9 |
| Dry batteries | 84 | 4,862 | 2.9 | 90 | 5,215 | 2.9 |
| Packings | 106 | 6,491 | 3.1 | 88 | 6,239 | 3.5 |
| Boiler compounds | 92 | 10,209 | 5.5 | 79 | 7,642 | 4.8 |
| Dashpots and plungers | 75 | 3,886 | 2.6 | 61 | 5,285 | 4.3 |
| Electrotype dust | 47 | 5,401 | 5.7 | 46 | 6,821 | 7.4 |
| Ladle stoppers | 147 | 15,005 | 5.1 | 43 | 4,527 | 5.3 |
| Electrodes | 39 | 2,133 | 2.7 | 37 | 2,110 | 2.9 |
| | 33,511 | 2,452,457 | 3.7 | 26,960 | 1,865,665 | 3.5 |
| Semi-finished product | 6,070 | 432,741 | 3.6 | 5,336 | 336,013 | 3.1 |
| Grand total | 39,581 | 2,885,198 | 3.6 | 32,305 | 2,201,678 | 3.4 |

## PRODUCTION

The sales of natural graphite by producers in the United States fell from 4,971 short tons in 1924 to 4,665 tons in 1925, a decrease of 306 tons, or 6 per cent. The quantity of amorphous graphite, which in 1925 constituted 76 per cent of the total output, decreased 535 tons, or 13 per cent, compared with 1924. The output of crystalline graphite increased 456,925 pounds, or 25 per cent, compared with 1924. The total value of the amorphous graphite increased slightly—3 per cent—and the value of the crystalline graphite increased $7,744, or 16 per cent, compared with 1924. The production of amorphous graphite was reported from Michigan, Nevada, and Rhode Island, and crystalline graphite from Alabama, Montana, and Texas. Rhode Island was the largest producer of amorphous graphite and Texas the largest producer of crystalline graphite.

*Natural graphite sold by producers in the United States, 1916-1925*

| Year | Number of operators reporting sales | Amorphous | | Crystalline | | Total value |
|---|---|---|---|---|---|---|
| | | Short tons | Value | Pounds | value | |
| 1916 | 23 | 2,622 | $20,723 | .0,931,989 | $914,748 | $935,471 |
| 1917 | 33 | 8,301 | 73,481 | .0,584,080 | 1,094,398 | 1,167,879 |
| 1918 | 42 | 6,560 | 69,455 | .2,861,839 | 1,454,799 | 1,524,254 |
| 1919 | 20 | 3,379 | 47,716 | 8,086,191 | 731,141 | 778,857 |
| 1920 | 17 | 4,694 | 49,758 | 9,632,360 | 576,444 | 626,202 |
| 1921 | 8 | 1,842 | 20,860 | 1,189,523 | 75,664 | 96,524 |
| 1922 | 7 | 2,200 | * | 1,849,766 | 85,242 | * |
| 1923 | 7 | 4,056 | 39,560 | 3,964,900 | 151,434 | 190,994 |
| 1924 | 5 | 4,071 | 38,533 | 1,800,325 | 48,977 | 87,510 |
| 1925 | 6 | 3,536 | 39,640 | | | |

*Bureau of Mines not at liberty to publish value.

## PRODUCER

Flaketown Graphite Co., Chilton County, Alabama.

# IRON ORE, PIG IRON, AND STEEL

By Hubert W. Davis*

## General Review

In 1925 the production and the shipments of iron ore increased respectively 14 and 23 per cent as compared with 1924. The production ranked about with that of 1919, and was 116 per cent of the average for the preceding 5 years and 102 per cent of the average for the preceding 10 years. The output of pig iron increased 17 per cent as compared with 1924 and was about 120 per cent of the average of the preceding 5 years and about 111 per cent of the average for the preceding 10 years. This output was about equal to that of 1920, and is the sixth largest on record.

The average value per ton for iron ore at the mines decreased 13 per cent and that of pig iron at the blast furnaces 6 per cent. The quoted prices of ferromanganese were higher but those of spiegeleisen and steel were considerably lower. In operating conditions and resulting production in the iron and steel industry the year 1925 was highly satisfactory. Earnings showed some improvement over those for 1924.

In July, 1924, the Federal Trade Commission ordered the discontinuance of the system of basing steel prices on the price at the Pittsburgh mills plus the freight to destination, but the ultimate effects of this order have not become established; as yet the relative positions of the chief producing districts have not changed much.

Labor conditions seem to have been fairly satisfactory at both mines and mills. A reduction of 10 to 15 per cent in wages at a few mines in the Lake Superior district went into effect during 1925 and caused strikes at some of the mines, but it affected only a small proportion of the total men employed. Transportation conditions were satisfactory, and there was an almost uninterrupted flow of ore from mines to furnaces.

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*Figures of imports and exports compiled by J. A. Dorsey, of the Bureau of Mines, from records of the Bureau of Foreign and Domestic Commerce.

The railroads were the leading buyers of steel in 1925, although the quantity was lower proportionately than in 1924. The automobile industry was a good customer, buying more than in 1924, as did also manufacturers of food containers and agricultural implements.

The total domestic output of pig iron required about 72 per cent of the theoretical annual capacity, according to figures of the American Iron and Steel Institute, but this capacity was not utilized steadily. At the beginning of 1925 there were only 235 furnaces in blast; on June 30 there were 198, and at the end of the year there were 238. The production of steel ingots is considered to have been about 79 per cent of the theoretical capacity, having ranged from about 66 per cent of the capacity in July to 90 per cent in March. The output of pig iron in the United States represented nearly one-half of the world's production and was about equal to that of all the producing countries of Europe combined. The production of these European countries increased about 9 per cent, compared with an increase of 17 per cent in the United States.

Iron-ore mining in the Lake Superior district had a busy year in 1925 because of larger demand, although ore prices were cut about 50 cents a ton. Eastern furnaces took about 500,000 tons of Lake ore; they bought chiefly foreign ores that they could get more cheaply. The shipments of domestic and foreign iron ore and manganiferous iron ore to blast furnaces exceeded the consumption of these ores by about 2,500,000 tons in 1925. From the shippers' standpoint the price received for the ore in 1925 was unsatisfactory, for the price was lower and there was no material reduction in such mining charges as labor, supplies, and taxes. In consequence, many mines worked at a loss and few showed a profit. The season of 1925 ended with stockpiles smaller than at the close of 1924. The total decrease in stocks in the Lake Superior district amounted to 15 per cent.

## IRON ORE

### Quantities Mined and Shipped in 1925

In the accompanying table the quantities of iron ore shown include beneficiated ore; that is, ore treated in any way, rather than the crude ore. The figures on both production and shipments include the iron ore used for fluxing other metallic ores at smelters in the Western States, but the shipments do not include the iron ore sold for the manufacture of paint, which amounted to 26,521 gross tons in 1925, valued at $140,986, or $5.32 a ton, compared with 20,630 tons in 1924, valued at $103,626, or $5.02 a ton. The output of manganiferous iron ore (including ore used for flux), which contained 5 per cent or more of manganese, amounted to 1,448,054 gross tons, valued at $3,752,486, as compared with 898,648 tons, valued at $2,739,254, in 1924. In Arkansas one producer shipped a small quantity of loadstone, which is not included in the tabulated statistics of iron ore. Neither do the statistics include iron sinter recovered from copper sulphide ore, 5,290 tons of which, carrying in excess of 64 per cent of iron, was made in Tennessee in 1925.

In both 1924 and 1925 iron ore was mined in 20 States. All the iron ore produced in California and Montana and a small quantity of that produced in New Jersey and Utah was used for flux; a small quantity of ore from New Jersey and Pennsylvania was used for purifying gas; all of the output from Washington was used in the manufacture of ferromagnesite; the ore produced in the remaining States was mainly for use in blast furnaces; Michigan, Minnesota, New Jersey, New York, Pennsylvania, Tennessee, and Wisconsin produced small quantities that were used for paint. The rank of the three States producing the largest quantity of iron ore—Minnesota, Michigan, and Alabama—remained virtually unchanged. Minnesota, which has furnished nearly 61 per cent of the total for the United States in the last five years, is producing more iron ore than all the rest of the States together.

The ores of iron are classed under the four heads—hematite, brown ore, magnetite, and carbonate.**

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**Notes on the composition of these ores are given in Mineral Resources, 1916, pt. 1, 1918, pp. 537-541.

*Iron ore mined in the United States, 1924-25, by States and varieties, in gross tons, with percentage of increase or decrease in 1925*

(Exclusive of ore containing 5 per cent or more of manganese)

| State | Hematite | Brown ore | Magnetite | Carbonate | Total | Percentage of increase or decrease in 1925 |
|---|---|---|---|---|---|---|
| 1924 | | | | | | |
| Alabama | 6,398,119 | 595,494 | | | 6,993,613 | |
| California | | | 435 | | 435 | |
| Colorado | | 4,702 | | | 4,702 | |
| Georgia | 38,217 | 74,822 | | | 113,039 | |
| Michigan | 12,350,755 | | | | 12,350,755 | |
| Minnesota | 31,857,132 | | 44,953 | | 31,902,085 | |
| Missouri | 72,425 | 7,422 | | | 79,847 | |
| Montana | * | *3,913 | | | 3,913 | |
| New Jersey | | | 65,197 | | 65,197 | |
| New Mexico | | | 189,371 | | 189,371 | |
| New York | 12,966 | | 242,866 | | 255,832 | |
| North Carolina | | 12,525 | | | 12,525 | |
| Ohio | | | | 244 | 244 | |
| Pennsylvania | | 1,014 | 803,189 | 3,005 | 807,208 | |
| Tennessee | 171,254 | 8,599 | | | 179,853 | |
| Utah | *148,278 | *15,876 | | | 164,154 | |
| Virginia | | 89,792 | | | 89,792 | |
| Washington | | | 1,700 | | 1,700 | |
| Wisconsin | 690,058 | | | | 690,058 | |
| Wyoming | 363,096 | | | | 363,096 | |
| | *52,102,300 | *814,159 | 1,347,711 | 3,249 | 54,267,419 | |
| 1925 | | | | | | |
| Alabama | 6,453,875 | 639,375 | | | 7,093,250 | +1 |
| California | | | 352 | | 352 | —19 |
| Colorado | | 8,642 | | | 8,642 | +84 |
| Georgia | 11,618 | 67,217 | | | 78,835 | —30 |
| Michigan | 14,490,529 | | | | 14,490,529 | +17 |
| Minnesota | 36,856,244 | | | | 36,856,244 | +16 |
| Missouri | 40,043 | | | | 40,043 | —50 |
| Montana | * | *3,672 | | | 3,672 | —6 |
| New Jersey | | | 202,942 | | 202,942 | +211 |
| New Mexico | | | 172,959 | | 172,959 | —9 |
| New York | 15,731 | | 125,803 | | 141,534 | —45 |
| North Carolina | | 5,753 | 16,258 | | 22,011 | +76 |
| Ohio | | | | 2,410 | 2,410 | +888 |
| Pennsylvania | | 1,039 | 952,623 | 2,293 | 955,955 | +18 |
| Tennessee | 106,557 | 58,160 | | | 164,717 | —8 |
| Utah | *265,322 | *4,470 | 237 | | 270,029 | +64 |
| Virginia | | 96,272 | | | 96,272 | +7 |
| Washington | | | 830 | | 830 | —51 |
| Wisconsin | 817,149 | | | | 817,149 | +18 |
| Wyoming | 489,622 | | | | 489,622 | +35 |
| | *59,546,690 | *884,600 | 1,472,004 | 4,703 | 61,907,997 | +14 |

*Some hematite included with brown ore.

The ore reported as sold for fluxing other than in the manufacture of pig iron amounted to 34,876 gross tons, valued at $63,678, as compared with 31,212 tons, valued at $96,209, in 1924. The ore reported sold for purifying gas amounted to 1,969 tons, valued at $16,829. The domestic iron ore sold for the manufacture of pig iron amounted to 63,887,088 gross tons, valued at $160,714,511, as compared with 52, 048,419 tons, valued at $151,191,475, in 1924.

*Iron ore shipped from mines in the United States, 1924-25, by States and uses, in gross tons*

(Exclusive of ore containing 5 per cent or more of manganese)

| State | Pig iron | Flux | Paint | Other | Total |
|---|---|---|---|---|---|
| 1924 | | | | | |
| Alabama | 6,557,596 | ---------- | ---------- | ---------- | 6,557,596 |
| California | ---------- | 435 | ---------- | ---------- | 435 |
| Colorado | 4,702 | ---------- | ---------- | ---------- | 4,702 |
| Georgia | 112,059 | ---------- | 482 | ---------- | 112,541 |
| Michigan | 11,248,641 | ---------- | 2,296 | ---------- | 11,250,937 |
| Minnesota | 31,076,114 | ---------- | ---------- | ---------- | 31,076,114 |
| Missouri | 79,847 | ---------- | ---------- | ---------- | 79,847 |
| Montana | ---------- | 3,913 | ---------- | ---------- | 3,913 |
| New Jersey | 100,093 | ---------- | 208 | 1,030 | 101,331 |
| New Mexico | 189,371 | ---------- | ---------- | ---------- | 189,371 |
| New York | 303,386 | ---------- | 12,966 | ---------- | 316,352 |
| North Carolina | 12,525 | ---------- | ---------- | ---------- | 12,525 |
| Ohio | 244 | ---------- | ---------- | ---------- | 244 |
| Pennsylvania | 806,397 | ---------- | 3,005 | 1,014 | 810,416 |
| Tennessee | 179,293 | ---------- | 560 | ---------- | 179,853 |
| Utah | 144,525 | 19,629 | ---------- | ---------- | 164,154 |
| Virginia | 91,759 | ---------- | ---------- | ---------- | 91,759 |
| Washington | ---------- | ---------- | ---------- | 1,700 | 1,700 |
| Wisconsin | 786,006 | ---------- | 1,113 | ---------- | 787,119 |
| Wyoming | 355,861 | 7,235 | ---------- | ---------- | 363,096 |
| | 52,048,419 | 31,212 | 20,630 | 3,744 | 52,104,005 |
| 1925 | | | | | |
| Alabama | 6,891,081 | ---------- | ---------- | ---------- | 6,891,081 |
| California | ---------- | 352 | ---------- | ---------- | 352 |
| Colorado | 8,642 | ---------- | ---------- | ---------- | 8,642 |
| Georgia | 79,488 | ---------- | ---------- | ---------- | 79,488 |
| Michigan | 15,254,003 | ---------- | 4,604 | ---------- | 15,258,607 |
| Minnesota | 38,022,237 | ---------- | 84 | ---------- | 38,022,321 |
| Missouri | 40,043 | ---------- | ---------- | ---------- | 40,043 |
| Montana | ---------- | 3,672 | ---------- | ---------- | 3,672 |
| New Jersey | 162,451 | 1,142 | 952 | 930 | 165,475 |
| New Mexico | 172,959 | ---------- | ---------- | ---------- | 172,959 |
| New York | 413,517 | ---------- | 15,731 | ---------- | 429,248 |
| North Carolina | 22,011 | ---------- | ---------- | ---------- | 22,011 |
| Ohio | 2,410 | ---------- | ---------- | ---------- | 2,410 |
| Pennsylvania | 916,216 | ---------- | 2,293 | 1,039 | 919,548 |
| Tennessee | 164,073 | ---------- | 644 | ---------- | 164,717 |
| Utah | 238,819 | 29,710 | ---------- | ---------- | 268,529 |
| Virginia | 76,302 | ---------- | ---------- | ---------- | 76,302 |
| Washington | ---------- | ---------- | ---------- | 830 | 830 |
| Wisconsin | 933,214 | ---------- | 2,213 | ---------- | 935,427 |
| Wyoming | 489,622 | ---------- | ---------- | ---------- | 489,622 |
| | 63,887,088 | 34,876 | 26,521 | 2,799 | 63,951,284 |

## *Iron ore shipped from mines in the United States, 1924-25, by States*

(Exclusive of ore containing 5 per cent or more of manganese and of ore sold for paint)

| State | 1924 | | 1925 | | | |
|---|---|---|---|---|---|---|
| | Gross tons | Value | Gross tons | Value | Percentage of increase or decrease | |
| | | | | | Quantity | Value |
| Alabama | 6,557,596 | $13,927,551 | 6,891,081 | $14,134,677 | +5 | +1 |
| California | 435 | * | 352 | * | —19 | |
| Colorado | 4,702 | * | 8,642 | * | +84 | |
| Georgia | 112,059 | 285,128 | 79,488 | 231,683 | —29 | —19 |
| Michigan | 11,248,641 | 35,605,902 | 15,254,003 | 40,926,315 | +36 | +15 |
| Minnesota | 31,076,114 | 93,311,092 | 38,022,237 | 96,083,485 | +22 | +3 |
| Missouri | 79,847 | 405,622 | 40,043 | * | —50 | |
| Montana | 3,913 | 10,846 | 3,672 | 10,244 | —6 | —6 |
| Montana | | | | | | |
| New Jersey | 101,123 | 420,488 | 164,523 | 678,021 | +63 | +61 |
| New Mexico | 189,371 | * | 172,959 | * | —9 | |
| New York | 303,386 | 1,448,616 | 413,517 | 1,988,735 | +36 | +37 |
| North Carolina | 12,525 | 32,512 | 22,011 | 49,511 | +76 | +52 |
| Ohio | 244 | * | 2,410 | * | +888 | |
| Pennsylvania | 807,411 | 1,881,122 | 917,255 | 2,149,800 | +14 | +14 |
| Tennessee | 179,293 | 431,682 | 164,073 | 369,144 | —8 | —14 |
| Utah | 164,154 | 234,348 | 268,529 | 361,251 | +64 | +54 |
| Virginia | 91,759 | 250,279 | 76,302 | 174,454 | —17 | —30 |
| Washington | 1,700 | * | 830 | * | —51 | |
| Wisconsin | 786,006 | 2,044,762 | 933,214 | 2,260,388 | +19 | +11 |
| Wyoming | 363,096 | * | 489,622 | * | +35 | |
| Undistributed | | **1,017,155 | | **1,379,178 | | |
| | 52,083,375 | 151,307,105 | 63,924,763 | 160,796,886 | +23 | +6 |

*Included under "Undistributed." **This figure includes value for States entered as "*" above.

## *Iron ore shipped from mines in the United States, 1916-1925*

(Exclusive of ore containing 5 per cent or more of manganese and of ore sold for paint)

| Year | Gross tons | Value | Year | Gross tons | Value |
|---|---|---|---|---|---|
| 1916 | 77,870,553 | $181,902,277 | 1921 | 26,652,528 | $89,745,308 |
| 1917 | 75,573,207 | 238,260,444 | 1922 | 50,612,620 | 157,209,286 |
| 1918 | 72,021,202 | 244,368,147 | 1923 | 69,811,472 | 240,738,921 |
| 1919 | 56,372,784 | 197,312,517 | 1924 | 52,083,375 | 151,307,105 |
| 1920 | 69,281,341 | 285,006,327 | 1925 | 63,924,763 | 160,796,886 |

*Iron ore mined in the United States, by mining districts and varieties, 1924-25, in gross tons*

(Exclusive of ore containing 5 per cent or more of manganese)

| District | Hematite | Brown ore | Magnetite | Carbonate | Total | Percentage of increase or decrease in 1925 |
|---|---|---|---|---|---|---|
| 1924 | | | | | | |
| Lake Superior* | 44,796,766 | ---------- | 44,953 | ---------- | 44,841,719 | ---------- |
| Birmingham | 6,214,381 | 296,931 | ---------- | ---------- | 6,511,313 | ---------- |
| Chattanooga | 376,693 | 171,004 | ---------- | ---------- | 547,697 | ---------- |
| Adirondack | ---------- | ---------- | 197,437 | ---------- | 197,437 | ---------- |
| Northern New Jersey and southeastern New York | ---------- | ---------- | 110,626 | ---------- | 110,626 | ---------- |
| Other districts | **714,460 | **346,224 | 994,695 | 3,249 | 2,058,628 | ---------- |
| | **52,102,300 | **814,159 | 1,347,711 | 3,249 | 54,267,419 | ---------- |
| 1925 | | | | | | |
| Lake Superior* | 52,056,663 | ---------- | ---------- | ---------- | 52,056,663 | +16 |
| Birmingham | 6,312,207 | 323,599 | ---------- | ---------- | 6,635,806 | +2 |
| Chattanooga | 259,843 | 96,877 | ---------- | ---------- | 356,720 | —35 |
| Adirondack<br>Northern New Jersey and southeastern New York | ---------- | ---------- | 328,745 | ---------- | 328,745 | +7 |
| Other districts | | | | 4,703 | 2,530,063 | +23 |
| | **59,546,690 | **884,600 | 1,472,004 | 4,703 | 61,907,997 | +14 |

*Includes only those mines in Wisconsin which are in the true Lake Superior district.
**Some hematite included with brown ore.

The Lake Superior district, which comprises Minnesota, Michigan, and northern Wisconsin, mined 84 per cent of the total ore in 1925; and the Birmingham district mined 11 per cent. The Chattanooga and Adirondack districts were the only ones to produce less ore in 1925 than in 1924.

The following table shows the production of iron ore in the United States so far as it has been recorded or estimated. The figures for the years prior to 1860 are not strictly accurate, as they were calculated from the pig iron produced and included both imported and domestic ore. Details for the years 1880 to 1916 may be found in Mineral Resources for 1916.

*Iron ore mined in the United States, 1810-1925, in gross tons*
(Exclusive after 1905 of ore containing 5 per cent or more of manganese)

| Year | Hematite | Brown ore | Magnetite | Carbonate | Total |
|---|---|---|---|---|---|
| 1810-1860 | ---------- | ---------- | ---------- | ---------- | 49,656,000 |
| 1870*-1880 | ---------- | ---------- | ---------- | ---------- | 51,690,889 |
| 1881-1890 | ---------- | ---------- | ---------- | ---------- | 103,854,386 |
| 1891-1900 | 136,961,046 | 22,845,764 | 14,634,364 | 1,065,137 | 175,506,311 |
| 1901-1910 | 364,179,432 | **28,287,994 | **20,664,453 | 262,366 | 413,394,245 |
| 1911-1915 | 239,419,251 | 8,355,102 | 10,156,539 | 42,495 | 257,973,387 |
| 1916 | 70,728,024 | 1,904,484 | 2,533,364 | 1,800 | 75,167,672 |
| 1917 | 70,743,513 | 1,992,332 | 2,553,006 | ---------- | 75,288,851 |
| 1918 | 65,894,709 | 1,613,844 | 2,149,725 | ---------- | 69,658,278 |
| 1919 | †57,719,582 | 1,127,397 | †2,118,439 | ---------- | 60,965,418 |
| 1920 | †§63,883,523 | §1,325,661 | †2,391,541 | 3,740 | 67,604,465 |
| 1921 | †§28,337,249 | §370,154 | †780,866 | 2,709 | 29,490,978 |
| 1922 | §44,888,723 | §783,582 | 1,452,966 | 3,256 | 47,128,527 |
| 1923 | §65,924,454 | §1,232,848 | 2,190,624 | 3,516 | 69,351,442 |
| 1924 | §52,102,300 | §814,159 | 1,347,711 | 3,249 | 54,267,419 |
| 1925 | §59,546,690 | §884,600 | 1,472,004 | 4,703 | 61,907,997 |
|  | ---------- | ---------- | ---------- | ---------- | 1,662,906,265 |

*Includes ore produced by owners of blast furnaces, estimated by census at 800,000 tons.
**Some brown ore included with magnetite.
†Some magnetite included with hematite.
§Some hematite included with brown ore.

### PRINCIPAL IRON-ORE MINES

In 1925 there were 238 iron-ore mines active, compared with 260 in 1924 and 309 in 1923; 130 mines produced more than 100,000 gross tons of iron each, compared with 117 in 1924 and 139 in 1923. Of these 130 mines, 10 (8 in Minnesota, 1 in Alabama, and 1 in Michigan) produced more than 1,000,000 tons each, as against 9 (7 in Minnesota, 1 in Alabama, and 1 in Michigan) in both 1924 and 1923. The operators of all but one of these large mines have permitted the publication of output, and the figures are given in the table that follows. The predominance of hematite as an iron ore is clearly shown by the fact that of these 130 large mines only 5 produced magnetite and 1 produced brown ore. The trend toward large mining units is shown in the production of nearly 96 per cent of the output of the country by the 130 mines that yielded more than 100,000 tons each. The 10 mines that produced more than 1,000,000 tons each in 1925 furnished over 37 per cent of the total. The average production per mine in 1925 was 260,118 tons, as compared with 208,721 tons in 1924.

## *Iron-ore mines of the United States that produced more than 100,000 gross tons each in 1925*

| Rank | Name of Mine | State | Nearest town | Variety of ore | Gross tons |
|---|---|---|---|---|---|
| 1 | Hull-Rust | Minnesota | Hibbing | Hematite | 5,141,909 |
| 2 | Missabe Mountain | do | Virginia | do | 3,605,071 |
| 3 | *Red Mountain group* | *Alabama* | *Bessemer* | do | 3,605,071 |
| 4 | Mahoning | Minnesota | Hibbing | do | 1,818,560 |
| 5 | Canisteo | do | Coleraine | do | 1,749,416 |
| 6 | Morris | do | Hibbing | do | 1,639,229 |
| 7 | Spruce | do | Eveleth | do | 1,565,636 |
| 8 | Norrie group | Michigan | Ironwood | do | 1,475,871 |
| 9 | Sellers | Minnesota | Hibbing | do | 1,380,377 |
| 10 | Hill Annex | do | Calumet | do | 1,210,344 |
| 11 | *Woodward Nos. 1, 2, and 3* | *Alabama* | *Bessemer* | do | 975,028 |
| 12 | Holman | Minnesota | Taconite | do | 864,931 |
| 13 | Newport (including Bonnie) | Michigan | Ironwood | do | 845,286 |
| 14 | Cornwall | Pennsylvania | Miners-Village | Magnetite | 830,256 |
| 15 | Dunwoody | Minnesota | Chisholm | Hematite | 776,312 |
| 16 | Bennett | do | Keewatin | do | 661,263 |
| 17 | Fayal | Minnesota | Eveleth | Hematite | 654,735 |
| 18 | Pioneer | do | Ely | do | 646,697 |
| 19 | Leonidas | do | Eveleth | do | 636,276 |
| 20 | *Sloss Nos. 1 and 2* | Alabama | *Bessemer* | do | 604,126 |
| 21 | Wakefield | Michigan | Wakefield | do | 603,856 |
| 22 | Montreal | Wisconsin | Montreal | do | 582,466 |
| 23 | Glenn | Minnesota | Chisholm | do | 580,635 |
| 24 | Hill-Trumbull | do | Marble | do | 504,987 |
| 25 | Adams | do | Eveleth | do | 499,903 |
| 26 | Boeing | do | Hibbing | do | 498,473 |
| 27 | *Raimund Nos. 1 and 2* | *Alabama* | *Bessemer* | do | 492,828 |
| 28 | Sunrise | Wyoming | Sunrise | do | 489,622 |
| 29 | Ironton | Michigan | Bessemer | do | 472,800 |
| 30 | Plymouth | do | Wakefield | do | 471,930 |
| 31 | North Harrison | Minnesota | Pengilly | do | 460,536 |
| 32 | Webb | do | Hibbing | do | 438,333 |
| 33 | Nashwauk | do | Nashwauk | do | 434,355 |
| 34 | Chapin (including Millie) | Michigan | Iron Mountain | do | 423,489 |
| 36 | Miller | Minnesota | Chisholm | do | 420,971 |
| 35 | Wellington | do | Aurora | do | 409,337 |
| 37 | Scranton | do | Hibbing | do | 404,026 |
| 38 | Utica | do | do | do | 382,009 |
| 39 | Corsica | do | McKinley | do | 380,688 |
| 40 | Cliffs Shaft | Michigan | Ishpeming | do | 374,356 |
| 41 | Leonard | Minnesota | Chisholm | do | 366,544 |
| 42 | Wabigon | do | Buhl | do | 357,054 |
| 43 | Penn group | Michigan | Norway and Vulcan | do | 356,889 |
| 44 | Negaunee | do | Negaunee | do | 350,246 |
| 45 | Eureka | do | Ramsay | do | 346,169 |
| 46 | Bristol | do | Crystal Falls | do | 345,600 |
| 47 | Lake Superior | do | Ishpeming | do | 340,064 |
| 48 | Patrick | Minnesota | Pengilly | do | 337,703 |
| 49 | Danube | do | Bovey | do | 328,745 |
| 50 | *Redding* | *Alabama* | Bessemer | do | 327,725 |
| 51 | Zenith | Minnesota | Ely | do | 314,551 |
| 52 | Palms | Michigan | Bessemer | do | 306,821 |
| 53 | South Judd | Minnesota | Taconite | do | 303,012 |
| 54 | Berkshire | Michigan | Stambaugh | do | 301,824 |
| 55 | Biwabik (including Cincinnati). | Minnesota | Biwabik | do | 301,406 |
| 56 | Alexandria | do | Chisholm | do | 300,510 |
| 57 | *Russellville* | *Alabama* | Russellville | Brown ore | 291,869 |
| 58 | Laura | Minnesota | Hibbing | Hematite | 286,437 |
| 59 | La Rue | do | Nashwauk | do | 283,786 |
| 60 | Richmond | Michigan | Palmer | do | 283,002 |
| 61 | South Agnew | Minnesota | Buhl | do | 276,591 |
| 62 | Morris-Lloyd | Michigan | Ishpeming | do | 265,829 |
| 63 | Hiawatha | do | Iron River | do | 261,818 |
| 64 | Maitland | do | Palmer | do | 257,848 |
| 65 | Caspian | do | Iron River | do | 253,779 |
| 66 | Sargent | Minnesota | Keewatin | do | 253,616 |
| 67 | Stephenson | Michigan | Gwinn | do | 253,193 |
| 68 | Aragon | do | Norway | do | 252,828 |
| 69 | Armour No. 2 (including Cuyuna-Duluth). | Minnesota | Crosby | do | 251,233 |

### *Iron-ore mines of the United States that produced more than 100,000 gross tons each in 1925*—(Continued)

| Rank | Name of Mine | State | Nearest town | Variety of ore | Gross tons |
|---|---|---|---|---|---|
| 70 | Imperial | Michigan | Michigamme | do | 250,783 |
| 71 | Bengal | do | Iron River | do | 245,348 |
| 72 | Higgins No. 2 | Minnesota | Virginia | do | 244,675 |
| 73 | James | Michigan | Iron River | do | 239,983 |
| 74 | Iron Springs | Utah | Iron Springs | do | 238,074 |
| 75 | Harold | Minnesota | Stuntz | do | 234,948 |
| 76 | Puritan | Michigan | Ironwood | do | 234,837 |
| 77 | Kinney | Minnesota | Kinney | do | 228,630 |
| 78 | *Shannon* | *Alabama* | *Birmingham* | do | 227,889 |
| 79 | Wanless | Minnesota | Buhl | do | 226,602 |
| 80 | Dean | do | do | do | 223,746 |
| 81 | Lincoln | do | Virginia | do | 223,668 |
| 82 | Chisholm | do | Chisholm | do | 221,392 |
| 83 | Homer | Michigan | Iron River | do | 221,150 |
| 84 | Athens | do | Negaunee | do | 210,144 |
| 85 | Susquehanna | Minnesota | Hibbing | do | 206,968 |
| 86 | Sibley | do | Ely | do | 205,704 |
| 87 | Asteroid | Michigan | Ramsay | do | 203,293 |
| 88 | Albany | Minnesota | Hibbing | do | 201,943 |
| 89 | Riverton group | Michigan | Iron River | do | 201,793 |
| 90 | Commodore | Minnesota | Virginia | do | 200,024 |
| 91 | Mary Charlotte | Michigan | Negaunee | do | 198,956 |
| 92 | Shenango | Minnesota | Chisholm | do | 198,274 |
| 93 | Shada | do | Nashwauk | do | 194,350 |
| 94 | Leetonia | do | Carson Lake | do | 194,291 |
| 95 | Baltic (including Fogarty and Buck). | Michigan | Iron River | do | 194,287 |
| 96 | Monongahela | Michigan | Crystal Falls | Hematite | 192,330 |
| 97 | Meacham | Minnesota | Crosby | do | 190,423 |
| 98 | Holmes | Michigan | Ishpeming | do | 188,500 |
| 99 | Balkan (including Judson) | do | Alpha | do | 177,385 |
| 100 | Warner | do | Amasa | do | 176,509 |
| 101 | Union Hill (including Republic). | New Mexico | Fierro | Magnetite | 172,904 |
| 102 | *Irondale No. 2* | *Alabama* | *Irondale* | Hematite | 167,318 |
| 103 | Isabella | Michigan | Palmer | do | 161,137 |
| 104 | Sunday Lake | do | Wakefield | do | 156,682 |
| 105 | Kerr | Minnesota | Hibbing | do | 153,047 |
| 106 | Zimmerman | Michigan | Gaastra | do | 152,373 |
| 107 | Maas | do | Negaunee | do | 149,879 |
| 108 | Tilden | do | Bessemer | do | 148,034 |
| 109 | Keweenaw | do | do | do | 146,389 |
| 110 | Carpenter | do | Crystal Falls | do | 146,030 |
| 111 | *Attalla No. 1* | *Alabama* | *Attalla* | do | 140,788 |
| 112 | Barnes Hecker | Michigan | Ishpeming | do | 138,582 |
| 113 | Mt. Hope | New Jersey | Wharton | Magnetite | 134,562 |
| 114 | Davidson No. 1 | Michigan | Iron River | Hematite | 133,932 |
| 115 | Rogers | do | do | do | 131,562 |
| 116 | Cambria (including Lillie) | do | Negaunee | do | 129,198 |
| 117 | Rolling Mill | do | do | do | 124,628 |
| 118 | Little and Prindle | Minnesota | Keewatin | do | 123,584 |
| 119 | French Creek | Pennsylvania | St. Peters | Magnetite | 122,367 |
| 120 | Philbin | Minnesota | Hibbing | Hematite | 121,469 |
| 121 | Smith | do | do | do | 115,209 |
| 122 | Soudan | do | Soudan | do | 114,718 |
| 123 | Mary Ellen | do | Biwabik | do | 113,638 |
| 124 | Mikado | Michigan | Wakefield | do | 110,178 |
| 125 | Mayville | Wisconsin | Mayville | do | 106,743 |
| 126 | Maroco | Minnesota | Ironton | do | 106,405 |
| 127 | * | * | * | * | 105,433 |
| 128 | Bates | Michigan | Iron River | Hematite | 102,341 |
| 129 | Lamberton | Minnesota | Hibbing | do | 102,339 |
| 130 | Tobin | Michigan | Crystal Falls | do | 100,387 |
|  | Total (130 mines) |  |  |  | 59,209,663 |
|  | Output of 22 mines producing between 50,000 and 100,000 gross tons each |  |  |  | 1,523,988 |
|  | Output of 86 miners producing less than 50,000 gross tons each |  |  |  | 1,174,346 |
|  | Grand total of United States (238 mines) |  |  |  | 61,907,997 |

*Bureau of Mines not at liberty to publish identification.

### STOCKS OF IRON ORE AT MINES

According to the reports of producers, the total quantity of iron ore in stock at the mines at the end of 1925 amounted to 10,795,630 gross tons, compared with 12,410,619 tons at the end of 1924, a decrease of 13 per cent. As the quantity of ore in stock piles is of necessity partly estimated, resulting variations in the mine reports from year to year prevent an absolute balance between the quantity mined, the quantity shipped, and the stocks on hand. The reported stocks at the end of 1925 were about 867,500 tons below the average for the preceding five years.

*Stocks of iron ore at mines December 31, 1924 and 1925, in gross tons*

| State | 1924 | 1925 |
|---|---|---|
| Alabama | 109,461 | 149,974 |
| Georgia | 740,279 | 942,448 |
| Iowa | 653 | |
| Michigan | 12,165 | 12,165 |
| Minnesoea | 7,399,505 | 6,769,006 |
| Missouri | 3,537,237 | 2,645,543 |
| New Jersey | 3,079 | 2,629 |
| New York | 441,492 | 153,776 |
| Pennsylvania | 1,200 | 37,607 |
| Utah | | 1,934 |
| Virginia | 6,503 | 26,473 |
| Wisconsin | 159,045 | 54,075 |
| | 12,410,619 | 10,795,630 |

### VALUE OF IRON ORE PER TON

The table that follows gives the average value, at the mines, of the different classes of iron ore in 1924 and 1925 for each of the producing States of groups of States except where the shippers of a certain variety of ore in a State were less than three and permission was not given to publish the value. These figures are taken directly from statements of the producers and probably represent the commercial selling prices only approximately, as all the reports are not consistent. Some of them evidently include mining costs only; others contain, in addition, the cost of selling and insuring the ore; others include an allowance for a sinking fund; and still others are the costs charged against the blast furnaces. None of the reports, however, is supposed to include freight charges.

*Average value per gross ton of iron at mines in the United States, 1924-25**

(Exclusive of ore containing 5 per cent or more of manganese and of ore sold for paint)

| State | Hematite | | Brown ore | | Magnetite | |
|---|---|---|---|---|---|---|
| | 1924 | 1925 | 1924 | 1925 | 1924 | 1925 |
| Alabama | $2.06 | $1.98 | $2.74 | $2.79 | ------ | ------ |
| Georgia | ** | ** | 2.73 | 3.04 | ------ | ------ |
| Michigan | 3.17 | 2.68 | ------ | ------ | ------ | ------ |
| Minnesota | 3.00 | 2.53 | ------ | ------ | ** | ------ |
| Montana | † | † | †2.77 | †2.79 | ------ | ------ |
| New Jersey | ------ | ------ | ** | ** | ** | $4.11 |
| New York | ------ | ------ | ------ | ------ | $4.77 | 4.81 |
| North Carolina | ------ | ------ | 2.60 | 2.30 | ------ | ** |
| Pennsylvania | ------ | ------ | ** | ** | 2.32 | 2.33 |
| Tennessee | ** | 1.97 | ** | 2.77 | ------ | ------ |
| Virginia | ------ | ------ | 2.73 | 2.29 | ------ | ------ |
| Wisconsin | 2.60 | 2.42 | ------ | ------ | ** | ------ |
| Other States§ | 2.13 | 1.71 | 2.95 | 3.31 | 2.71 | 1.94 |
| Whole U. S. | 2.91 | 2.50 | 2.75 | 2.78 | 2.95 | 3.07 |

*Carbonate of iron, used in making pig iron, was sold by one producer in Ohio in 1924 and 1925.

**Less than three producers and permission to publish not given, therefore value may not be shown.

†Value for hematite included with brown ore.

§1924: California, Colorado, Missouri, New Jersey, New Mexico, Tennessee, Utah, Washington, and Wyoming, 1925: California, Colorado, Missouri, New Mexico, Utah, Washington, and Wyoming.

### IRON ORE CONSUMED

The furnaces in Alabama consumed in 1925 an average of 2.466 tons of ore in making a ton of pig iron, the most for any State. The greater part of the ore used in Alabama furnaces is hematite carrying between 33 and 51 per cent of iron and is obtained from mines in Etowah and Jefferson Counties, Ala., and in Walker County, Ga. The brown ore used carried between 43 and 52 per cent of iron and was obtained chiefly from mines in the Birmingham and Russellville districts, Ala., and the Cedartown district, Ga.

The furnaces in Maryland, on the other hand, used mostly foreign ores—chiefly from Chile, Cuba, and Sweden—which have an iron content of about 65, 57, and 65 per cent, respectively. The Maryland furnaces consumed an average of only 1.470 tons of ore in making a ton of pig iron, the lowest for any State, but they used proportionately more mill cinder, scale, and scrap than the furnaces in Alabama.

The furnaces in Indiana, Michigan, Minnesota, Ohio, and West Virginia use Lake Superior iron ore exclusively, and the furnaces in

Wisconsin use ore from mines in the Lake Superior district and from the Mayville mine, in southern Wisconsin. The consumption of ores per ton of iron made ranges between 1.641 and 1.915 tons.

All the ore used by the furnaces in the Chicago district, including Joliet, Ill., and most of that used by the furnace at Granite City are obtained from mines in the Lake Superior district. In addition, the furnace at Granite City uses ore from the Baraboo district, in southern Wisconsin, which carries about 46 per cent of iron, and ore from the Rueppele and Iron Mountain mines in Missouri, the iron content of which is about 51 and 57 per cent, respectively.

Kentucky, consuming ore from the Lake Superior district and a little carbonate ore from Ohio, used an average of 0.302 ton of mill cinder, scale, and scrap to a ton of pig iron and therefore used an average of only 1.531 tons of ore to a ton of pig iron.

In New York, the furnaces in the Buffalo district use ore from the Lake Superior district and from Port Henry, N. Y., and the furnaces at Port Henry and Standish use local magnetites that carry between 60 and 64 per cent of iron. In the manufacture of a ton of pig iron an average of 1.84 tons of ore was used by these furnaces in 1925.

The furnaces in western Pennsylvania use ore mostly from the Lake Superior district; those in the eastern part of the State, in addition to using some Lake ore, use magnetite from the Cornwall and French Creek mines in Pennsylvania, which carries between 44 and 58 per cent of iron, New Jersey magnetite carrying 58 to 60 per cent of iron, New York magnetite carrying between 60 and 64 per cent of iron, and considerable quantities of ores from Africa, Chile, Cuba, Spain, and Sweden that carry 47 to 67 per cent of iron. An average of 1.728 tons of ore was used in 1925 to make a ton of pig iron.

The iron furnaces in Tennessee use brown ore from Lyles, Tenn., hematite from the Rockwood area, which carries between 35 and 41 per cent of iron, magnetite carrying about 42 per cent of iron from the Cranberry mine in North Carolina, brown ore from the Pace and Cover mines in Cherokee County, N. C., and brown ore from the Bartow and Reed mines in Georgia and the Rendalia mine in Alabama. In addition, some ore from Sweden and Africa was used. An average of 2.435 tons of ore and 0.193 ton of cinder, scale, and scrap—a total of 2.628 tons, the most for any State—was used per ton of iron made in 1925.

Virginia iron furnaces use local brown ores averaging between 40 and 54 per cent of iron, a small quantity of Lake Superior iron ore.

and some ore from France. These furnaces also used 0.346 ton of cinder, scale, and scrap to a ton of pig iron, the highest average for any State. The consumption of ore per ton of iron made was 1.748 tons.

The blast furnaces at Pueblo, Colo., used brown ore from the Orient mine in Colorado, hematite from the Sunrise mine in Wyoming, and magnetite from mines near Fierro, N. Mex. The blast furnace at Provo, Utah, used some iron ore from the Iron King mine, near Eureka, Utah, but by far the greater part was obtained from mines in the Iron Springs district, Utah.

The following two tabulations show the consumption of iron ore and other metallic materials, the production of pig iron (as reported to the Bureau of Mines), and the average quantities of materials used per ton of pig iron made.

*Iron ore and other metallic materials consumed and pig iron produced in 1925, by States, in gross tons*

| | Metalliferous materials consumed | | | | Pig iron produced, exclusive of ferro-alloys | Materials consumed per ton of iron made | | |
|---|---|---|---|---|---|---|---|---|
| | Iron and manganiferous iron ores | | Cinder, scale, and scrap | Total | | Ores | Cinder, scale, and scrap | Total |
| | Domestic | Foreign | | | | | | |
| Alabama | 6,936,782 | 5,903 | 332,755 | 7,275,440 | 2,815,728 | 2.466 | 0.118 | 2.584 |
| Colorado | * | ---------- | * | * | * | * | * | * |
| Illinois | 6,487,199 | ---------- | 392,299 | 6,879,498 | 3,604,255 | 1.800 | .109 | 1.909 |
| Indiana | 5,985,867 | ---------- | 615,681 | 6,601,548 | 3,353,217 | 1.785 | .184 | 1.969 |
| Kentucky | 238,627 | ---------- | 47,132 | 285,759 | 155,886 | 1.531 | .302 | 1.833 |
| Maryland | 18,892 | 989,288 | 88,977 | 1,097,157 | 685,662 | 1.470 | .130 | 1.600 |
| Michigan | 1,264,743 | ---------- | 71,690 | 1,336,433 | 766,594 | 1.650 | .093 | 1.743 |
| Minnesota | 522,688 | ---------- | 30,533 | 553,221 | 272,876 | 1.915 | .112 | 2.027 |
| New York | 3,826,986 | ---------- | 202,012 | 4,028,998 | 2,079,528 | 1.840 | .097 | 1.937 |
| Ohio | 14,391,750 | ---------- | 1,627,910 | 16,019,660 | 8,771,137 | 1.641 | .185 | 1.826 |
| Pennsylvania | 19,807,144 | 1,331,329 | 1,569,099 | 22,707,572 | 12,236,780 | 1.728 | .128 | 1.856 |
| Tennessee | 224,947 | 5,210 | 18,286 | 248,443 | 94,516 | 2.435 | .193 | 2.628 |
| Utah | * | ---------- | * | * | * | * | * | * |
| Virginia | 192,980 | 6,037 | 39,429 | 238,446 | 113,878 | 1.748 | .346 | 2.094 |
| West Virginia | 862,022 | ---------- | 34,020 | 896,042 | 494,598 | 1.743 | .069 | 1.812 |
| Wisconsin | 338,081 | ---------- | 23,354 | 361,435 | 195,603 | 1.729 | .119 | 1.848 |
| Undistributed | **931,026 | ---------- | **43,891 | **974,917 | **484,420 | **1.922 | **.091 | **2.013 |
| | 62,029,734 | 2,337,767 | 5,137,068 | 69,504,569 | 36,124,678 | 1.782 | .142 | 1.924 |

*Included under "Undistributed." **Includes figures for States entered as above "*."

### IRON-ORE MINING IN ALABAMA

A little more iron ore was mined in Alabama in 1925 than in 1924. Most of the ore is hematite, much of which is nearly self-fluxing. Hematite is produced chiefly in Jefferson County and the average iron content of that shipped in 1925 ranged between 33 and 40 per cent. The iron content of the hematite shipped from the Attalla No. 1 mine in Etowah County averaged 38.83 per cent, natural, in 1925, and that of the hematite from the Tumlin Gap mine, also in Etowah County, was reported as 51 per cent, natural.

Alabama is the largest producer of brown ore in the United States; its output of this type of ore in 1925 was more than 2½ times the output of all the other States together. The Russellville district led in production of brown ore in 1925; the iron content of the concentrates shipped averaged 51 per cent. Five mines were active in Tuscaloosa County during 1925; the average iron content of the washed ore shipped was between 45 and 50 per cent. Three mines were active in Blount County in 1925; the average iron content of the washed ore shipped was 50.25 per cent. Small quantities of brown ore were produced in Calhoun, Cherokee, Shelby, and Talladega Counties in 1925; the ore from Calhoun County averaged 46.78 per cent of iron, that from Cherokee County averaged 47 per cent, and that from Shelby County averaged 49 per cent.

### BENEFICIATED IRON ORE

In 1925 the process reported in use to improve the quality of the ore at the mines were crushing and screening, drying, hand picking, washing, jigging, electromagnetic separation, sintering, nodulizing, and desulphurization by sintering. Some operators combined two or more of these processes. Beneficiation of iron ore was reported at 62 mines in 11 States in 1925 and at 72 mines in 12 States in 1924. Some iron ore is also recovered in the form of dust from blast furnaces, but no statistics on it have been gathered. Ore so recovered was originally included in the statistics of shipments from the mines.

Beneficiated ore shipped from mines in the United States in 1925 increased 23 per cent in quantity and 10 per cent in total value as compared with 1924. Such figures as are available to show the relation between crude ore treated and beneficiated ore recovered indicate that in washing brown ore the ratios, by weight, of crude ore washed to resultant concentrates range from 7:1 to 1.25:1; in concentrating hematite, from 3.819:1 to 1.071:1; in concentrating magnetite, from 2.227:1 to 1.354:1; and in concentrating carbonate, 1.25:1.

The quantity of crude ore beneficiated in the Lake Superior district in 1925 amounted to 9,814,448 gross tons, and the beneficiated ore recovered was 6,408,946 tons—a reduction of 3,405,502 tons, and a ratio of 1.531:1. In 1924 the crude Lake ore treated amounted to 7,790,428 tons and the beneficiated ore recovered therefrom was 5,172,161 tons—a loss of 2,618,267 tons and a ratio of 1.506:1.

*Beneficiated iron ore shipped from mines in the United States, 1924-25*

(Exclusive of ore containing 5 per cent or more of manganese and of ore sold for paint)

| State | Variety | 1924 | | 1925 | |
|---|---|---|---|---|---|
| | | Gross tons | Value | Gross tons | Value |
| Alabama | Hematite, brown ore | 751,774 | $2,004,161 | 755,189 | $2,069,514 |
| Georgia | Brown ore | 59,754 | 168,288 | 67,217 | 204,480 |
| Michigan | Hematite | 24,946 | * | | |
| Minnesota | Hematite, magnetite | 5,134,264 | 15,055,757 | 6,410,362 | 15,617,011 |
| Missouri | Hematite, brown ore | 56,847 | 315,622 | 3,878 | * |
| New Jersey | Magnetite | 100,167 | * | 162,451 | 665,979 |
| New York | do | 257,506 | 1,274,367 | 393,299 | 1,917,622 |
| North Carolina | Brown ore | 11,425 | 30,081 | 5,753 | * |
| Pennsylvania | Magnetite | 439,473 | * | 662,744 | * |
| Tennessee | Hematite, brown ore | 143,846 | 347,908 | 138,432 | 332,276 |
| Virginia | | 22,895 | 61,687 | 30,536 | * |
| Wisconsin | Hematite, magnetite | **89,642 | * | 105,811 | * |
| Undistributed | | | 2,452,421 | | 3,176,215 |
| | | **7,092,539 | **21,710,292 | 8,735,672 | 23,983,097 |

*Included under "Undistributed." **Revised figures.

## PIG IRON

### SHIPMENTS, VALUE, AND PRODUCTION, BY STATES

The shipments of pig iron, exclusive of ferro-alloys, reported by the manufacturers to the Bureau of Mines, represent an increase of 19 per cent in quantity and 11 per cent in total value as compared with 1924. The values given represent the approximate amounts received for the iron f. o. b. furnaces and do not include freight costs, selling commissions, and other items that are figured in some of the market prices of pig iron as published in trade journals.

The pig iron shipped includes metal produced from foreign as well as from domestic ore. The pig iron made from ore imported from Africa, Brazil, Chile, Cuba, France, Greece, Russia, Spain, and Sweden, although it constitutes a very small percentage of the total production, amounted in 1925 to 1,436,564 gross tons, valued at $29,558,486, as compared with 1,330,868 tons, valued at $27,539,725, in 1924. In the manufacture during 1925 of 1,404,306 gross tons of pig iron, 2,337,767 gross tons of foreign iron ore is reported to have been used, indicating an average pig-iron yield of 60.07 per cent from imported ore. Domestic ore and 5,137,068 gross tons of cinder, scale, and scrap, amounting in all to 67,166,802 gross tons, were reported used in making 34,720,372 tons of pig iron, indicating an average pig-iron yield of 51.69 per cent from domestic materials. The total production of pig iron, exclusive of ferro-alloys, reported to the Bureau of Mines, was 36,124,678 gross tons, compared with 30,869,199 tons in 1924, an increase of 17 per cent.

*Pig iron shipped from blast furnaces in the United States, 1924-25, by States*

| State | 1924 | | 1925 | | | |
|---|---|---|---|---|---|---|
| | | | | | Percentage of increase or decrease | |
| | Gross tons | Value | Gross tons | Value | Value | Quantity |
| Alabama | 2,667,361 | $55,791,228 | 2,910,370 | $57,777,275 | +9 | +4 |
| Colorado | * | * | * | * | ........ | ........ |
| Illinois | 2,695,961 | 59,299,519 | 3,600,484 | 74,937,781 | +34 | +26 |
| Indiana | 2,571,411 | 52,507,720 | 3,350,747 | 64,807,575 | +30 | +23 |
| Kentucky | 99,055 | * | 153,935 | * | +55 | ........ |
| Maryland | 539,188 | * | 693,523 | * | +29 | ........ |
| Massachusetts | 50 | * | ........ | ........ | —100 | —100 |
| Michigan | 650,333 | 15,225,990 | 831,435 | 18,452,346 | +28 | +21 |
| Minnesota | 189,033 | * | 276,240 | * | +46 | ........ |
| Missouri | 21,371 | * | 3,758 | * | —82 | ........ |
| New Jersey | * | * | * | * | ........ | ........ |
| New York | 1,914,545 | 38,150,486 | 2,151,036 | 40,435,443 | +12 | +6 |
| Ohio | 7,434,487 | 159,701,131 | 8,857,615 | 173,418,068 | +19 | +9 |
| Pennsylvania | 10,962,288 | 237,052,035 | 12,537,809 | 258,140,674 | +14 | +9 |
| Tennessee | 126,660 | 2,782,154 | 95,186 | 2,014,176 | —25 | —28 |
| Utah | * | * | 126,746 | * | ........ | ........ |
| Virginia | 94,462 | 2,268,022 | 97,884 | 2,237,749 | +4 | —1 |
| West Virginia | 453,944 | 9,884,019 | 499,047 | 9,416,095 | +10 | —5 |
| Wisconsin | **471,545 | **28,471,299 | **402,175 | 4,836,952 | +31 | +23 |
| Undistributed | 172,435 | 3,945,369 | 226,712 | **32,842,199 | ........ | ........ |
| | 31,064,129 | 665,078,972 | 36,814,702 | 739,316,333 | +19 | +11 |

*Included under "Undistributed." **Includes figures for States entered as "*" above.

### AVERAGE VALUES

*Values at blast furnaces.*—The average value of all kinds of pig iron given in the accompanying table is based on reports of the manufacturers to the Bureau of Mines. The figures represent the approximate values f. o. b. at the blast furnaces and do not include the values of ferro-alloys. The general average value for all grades of pig iron at the furnaces, exclusive of ferro-alloys, decreased 6 per cent in 1925 and was the lowest for any year since 1916.

### *Average value per gross ton of pig iron at blast furnaces in the United States, 1920-1925*

| State | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 |
|---|---|---|---|---|---|---|
| Alabama | $32.70 | $24,33 | $19.29 | $19.72 | $20.92 | $19.85 |
| Illinois | 28.02 | 24.50 | 21.60 | 25.36 | 22.00 | 20.81 |
| Indiana | 25.58 | 22.32 | 19.65 | 23.26 | 20.42 | 19.34 |
| Kentucky | 31.72 | 28.77 | 21.05 | * | * | * |
| Michigan | 36.22 | 29.64 | 24.83 | 26.25 | 23.41 | 22.19 |
| Missouri | 45.04 | 28.19 | * | * | * | * |
| New Jersey | 38.23 | * | * | * | * | * |
| New York | 37.02 | 23.15 | 22.11 | 23.71 | 19.93 | 18.80 |
| Ohio | 29.93 | 24.24 | 22.17 | 24.76 | 21.48 | 19.58 |
| Pennsylvania | 33.27 | 24.43 | 22.77 | 25,02 | 21.62 | 20.59 |
| Tennessee | 42.55 | 27.12 | 21.65 | 26.95 | 21.97 | 21.16 |
| Virginia | 41.21 | 30.24 | 25.59 | 26.76 | 24.01 | 22.86 |
| West Virginia | 32.53 | 25.29 | 24.32 | 24.68 | 21.77 | 18.87 |
| Wisconsin | 33.98 | 29.15 | 23.75 | 25.90 | 22.88 | 21.34 |
| Other States** | 33.87 | 25.50 | 22.11 | 24.73 | 21.57 | 19.83 |
| Average for United States | 31.95 | 24.28 | 21.98 | 24.68 | 21.41 | 20.08 |

*Included under "Other States."

**1920: Colorado, Connecticut, Maryland, Massachusetts, and Minnesota. 1921: Colorado, Connecticut, Maryland, Massachusetts, Minnesota, and New Jersey. 1922: Colorado, Connecticut, Maryland, Massachusetts, Minnesota, Missouri, and New Jersey. 1923: Colorado, Kentucky, Maryland, Massachusetts, Minnesota, Missouri, and New Jersey. 1924: Colorado, Kentucky, Maryland, Massachusetts, Minnesota, Missouri, New Jersey, and Utah. 1925: Colorado, Kentucky, Maryland, Minnesota, Missouri, New Jersey, and Utah.

### *Blast furnaces in the United States, 1924 and 1925*

| State | In blast June 30, 1924 | Dec. 31, 1924 | | | In blast June 30, 1925 | Dec. 31, 1925 | | |
|---|---|---|---|---|---|---|---|---|
| | | In | Out | Total | | In | Out | Total |
| Pennsylvania | 55 | 87 | 59 | 146 | 60 | 84 | 51 | 135 |
| Ohio | 30 | 49 | 28 | 77 | 46 | 48 | 21 | 69 |
| Illinois | 8 | 18 | 8 | 26 | 15 | 16 | 9 | 25 |
| Alabama | 24 | 23 | 19 | 42 | 24 | 27 | 11 | 38 |
| New York | 9 | 15 | 12 | 27 | 10 | 17 | 10 | 27 |
| Virginia | 1 | 3 | 14 | 17 | 2 | 1 | 16 | 17 |
| Tennessee | 3 | 2 | 13 | 15 | 2 | 3 | 11 | 14 |
| Colorado | 3 | 2 | 3 | 5 | 3 | 3 | 2 | 5 |
| Missouri | 1 | | 3 | 3 | | | 3 | 3 |
| Utah | 1 | 1 | | 1 | 1 | 1 | | 1 |
| Maryland | 2 | 5 | 1 | 6 | 4 | 5 | 1 | 6 |
| New Jersey | | | 4 | 4 | | | 4 | 4 |
| Wisconsin | 2 | 1 | 6 | 7 | 1 | 2 | 4 | 6 |
| Minnesota | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 3 |
| Indiana | 10 | 14 | 2 | 16 | 14 | 16 | 1 | 17 |
| Michigan | 10 | 10 | 3 | 13 | 10 | 9 | 3 | 12 |
| West Virginia | 3 | 3 | 1 | 4 | 3 | 2 | 2 | 4 |
| Kentucky | 1 | 1 | 6 | 7 | 1 | 2 | 5 | 7 |
| Georgia | | | 1 | 1 | | | | |
| Texas | | | 1 | 1 | | | 1 | 1 |
| Mississippi | | | | | | | 1 | 1 |
| Connecticut | | | 2 | 2 | | | | |
| Massachusetts | | | 1 | 1 | | | | |
| | 164 | 235 | 190 | 425 | 198 | 238 | 157 | 395 |

## STEEL

### PRODUCTION

The following tables showing the production of steel were compiled by the American Iron and Steel Institute. No data whatever are available on the value of the output of crude steel at the mills, but the weekly issues and annual statistical reviews of the Iron Age give market quotations of prices of steel billets and some of the leading forms of finished steel. The price of Bessemer steel billets at Pittsburgh in 1925 ranged from $34.25 to $37 a gross ton; in 1924 it ranged from $35.50 to $40. Tank plates at Pittsburgh ranged from 1.8 to 2 cents a pound in 1925 and from 1.8 to 2.5 cents a pound in 1924. Structural shapes at Pittsburgh ranged from 1.9 to 2.1 cents a pound in 1925 and from 1.93 to 2.5 cents in 1924.

*Bessemer steel ingots and castings manufactured in the United States, 1921-1925, by States, in gross tons*

| State | 1921 | 1922 | 1923 | 1924 | 1925 |
|---|---|---|---|---|---|
| Ohio | 1,581,610 | 2,324,425 | 3,557,579 | 2,557,689 | 2,963,590 |
| Pennsylvania | 1,665,456 | 2,474,956 | 3,115,840 | 2,210,868 | 2,354,231 |
| Illinois | 532,539 | 707,067 | 1,057,576 | 598,442 | 740,212 |
| Other States | 236,333 | 412,850 | 753,093 | 532,591 | 665,929 |
| | 4,015,938 | 5,919,298 | 8,484,088 | 5,899,590 | 6,723,962 |

*Bessemer steel ingots and castings manufactured in the United States, 1921-1925, by States, in gross tons*

| State | 1921 | 1922 | 1923 | 1924 | 1925 |
|---|---|---|---|---|---|
| New England States | 102.642 | 204,343 | 268,630 | 252,273 | 296,091 |
| New York and New Jersey | 634,290 | 1,597,881 | 1,951,278 | 1,424,677 | 1,724,720 |
| Pennsylvania | 6,408,043 | 11,583,812 | 14,428,187 | 12,243,713 | 14,021.750 |
| Ohio | 3,108,332 | 6,770,293 | 7,786,820 | 7,119,786 | 8,799,951 |
| Indiana | 2,308,414 | 3,571,397 | 4,326,724 | 3,990,165 | 4,978,558 |
| Illinois | 1,093,268 | 2,077,920 | 2,579,095 | 2,184,068 | 2,817,027 |
| Other States | 1,934,813 | 3,503,337 | 4,558,923 | 4,362,668 | 5,396,391 |
| | 15,589,802 | 29,308,983 | 35,899,657 | 31,577,350 | 38,034,488 |

According to these tables there were increases of 14 per cent in the production of Bessemer steel and of 20 per cent in open-hearth steel in 1925, compared with 1924. The total production of steel increased 20 per cent. Of the total output in 1925, 84 per cent was represented by open-hearth steel, 15 per cent by Bessemer steel, and a little more than 1 pr cent by all other classes of steel.

Of the total output of open-hearth steel, 37,087,342 gross tons were made by the basic process and 947,146 tons by the acid process, compared with 30,719,523 tons of basic steel and 857,827 tons of acid steel in 1924.

The production of steel by the electric process in 1925 showed an increase of 42 per cent as compared with 1924.

## IRON ORE PRODUCERS

### BLOUNT COUNTY

Shook & Fletcher Supply Co. Tait's Gap, Nos. 1 and 2, and Champion mine.

### CALHOUN COUNTY

A. A. Janney. Janney mine.

### CHEROKEE COUNTY

Rock Run Iron Co. Langdon mine.

### ETOWAH COUNTY

Jirama Ore Co. (J. W. Hammond, Operator). Mine at Tumlin Gap.
Sloss-Sheffield Steel and Iron Co. Attalla No. 1 mine.

### FRANKLIN COUNTY

Sloss-Sheffield Steel and Iron Co. Russellville mine.
The Alabama Fuel and Iron Co. DeVarney mine.

### JEFFERSON COUNTY

Gulf States Steel Co. Shannon mine.
Republic Iron and Steel Co. Raimond 1 and 2, and Spaulding mines.
Sloss-Sheffield Steel and Iron Co. Sloss 1 and 2, and Irondale 2 and 3 mines.
Tennessee Coal, Iron and Railroad Co. Fossil (Wenonah), Ishkooda and Muscoda mines.
Woodward Iron Co.—Woodward 1, 2 and 3 and Songo mines.

### SHELBY COUNTY

Shelby Iron Co. Shelby mine.

### TALLADEGA COUNTY

Woodstock Operating Corp. Woodstock and Rendalia mines.

### TUSCALOOSA COUNTY

Central Iron and Coal Co. Giles mine.
Republic Iron and Steel Co. Tannehill and Houston mines.
Tennessee Coal, Iron and Railroad Co. Greeley mine.
Woodward Iron Co. Docray mine.

# LIME

## By A. T. Coons*

### General Conditions

Sales of lime by producers in the United States in 1925 increased 12 per cent in quantity and 8 per cent in value over 1924. The greatest gain was in sales of lime for agricultural use, which increased 20 per cent in quantity. Lime for construction increased 10 per cent and chemical lime 15 per cent in quantity. Maine was the only producing State of importance to show a definite decrease (8 per cent) in quantity of lime sold. Sales in Connecticut decreased slightly. Other decreases were in States where the output was small and of local importance only. Ohio, the largest producing State, increased 17 per cent in 1925, following an increase of 8 per cent in 1924, and Pennsylvania, the second State, increased 14 per cent in 1925, following a decrease of 9 per cent the preceding year. The total number of plants that reported operation was the same as in 1924. Labor conditions at the plants seemingly changed little during 1925, and wages and cost of materials were about the same as during 1924. There was a tendency toward lower prices, and the average value, at the plants, of lime sold decreased from $9.72 to $9.30 a ton.

Competition among the chief producers is close, and successful production depends so largely upon the economical operation of plants that in recent years much consideration has been given to their equipment and to the study of conditions under which operations can be carried on most advantageously in kilns and quarries.

The accompanying tables do not include a considerable amount of lime which is not a commercial product but is burned, for use in manufacturing, from stone either quarried or purchased by the manufacturer. This stone is reported to the bureau as raw limestone and is included in the statistics on stone. It is used mainly by alkali works, carbide works, sugar refineries, and smelters.

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*Figures on imports and exports compiled by J. A. Dorsey, of the Bureau of Mines, from records of the Bureau of Foreign and Domestic Commerce.

*Lime sold by producers in the United States, 1924-25, by States*

| State | 1924 |  |  | 1925 |  |  |
|---|---|---|---|---|---|---|
|  | Number of plants in operation | Short tons | Value | Number of plants in operation | Short tons | Value |
| Alabama | 10 | 204,059 | $1,812,282 | 11 | 207,699 | $1,679,155 |
| Arizona | 3 | 27,972 | 331,756 | 3 | 39,045 | 394,023 |
| Arkansas | 3 | 13,984 | 131,108 | 5 | 24,791 | 223,965 |
| California | 10 | 59,583 | 658,138 | 10 | 70,805 | 745,132 |
| Colorado | 4 | * | * | 3 | * | * |
| Connecticut | 6 | 58,851 | 196,541 | 6 | 58,449 | 672,821 |
| Florida | 2 | * | * | 3 | 17,793 | 186,650 |
| Georgia | 1 | * | * | 1 | * | * |
| Hawaii | 1 | * | * | 1 | * | * |
| Idaho | 1 | * | * | 1 | * | * |
| Illinois | 10 | 89,132 | 934,199 | 10 | 96,066 | 928,632 |
| Indiana | 7 | 116,927 | 991,003 | 7 | 127,878 | 1,067,040 |
| Iowa | 2 | * | * | 2 | * | * |
| Kentucky | 3 | 8,091 | 58,228 | 3 | 9,433 | 71,300 |
| Maine | 4 | 125,688 | 1,809,929 | 4 | 115,571 | 1,291,812 |
| Maryland | 11 | 56,178 | 470,105 | 12 | 64,518 | 524,100 |
| Massachusetts | 11 | 194,402 | 2,693,028 | 9 | 197,732 | 2,610,279 |
| Michigan | 7 | 73,096 | 702,072 | 8 | 95,036 | 909,952 |
| Minnesota | 4 | 25,764 | 319,066 | 3 | * | * |
| Missouri | 18 | 243,465 | 2,354,175 | 18 | 273,348 | 2,610,954 |
| Montana | 3 | 2,374 | 25,316 | 3 | 6,269 | 44,992 |
| Nevada | 1 | * | * | 1 | * | * |
| New Jersey | 3 | 204 | 1,516 | 2 | * | * |
| New Mexico | 3 | 2,389 | 23,975 | 3 | 1,329 | 14,010 |
| New York | 12 | 98,592 | 991,799 | 12 | 104,829 | 1,030,960 |
| North Carolina | 1 | * | * | 1 | * | * |
| Ohio | **32 | 934,407 | 9,511,270 | 33 | 1,089,385 | 10,970,605 |
| Oklahoma | 1 | * | * | 2 | * | * |
| Oregon | 2 | * | * | 1 | * | * |
| Pennsylvania | 136 | 700,380 | 5,634,806 | 142 | 794,951 | 6,425,675 |
| Porto Rico | 19 | 8,264 | 132,365 | 18 | 9,988 | 148,326 |
| Rhode Island | 1 | * | * | 1 | * | * |
| South Dakota | 2 | * | * | 2 | * | * |
| Tennessee | 18 | 144,292 | 1,111,781 | 14 | 175,685 | 1,344,508 |
| Texas | 5 | 60,565 | 570,334 | 6 | 74,638 | 698,138 |
| Utah | 10 | 12,853 | 172,434 | 9 | 22,062 | 265,060 |
| Vermont | 10 | 56,484 | 710,739 | 10 | 66,245 | 788,936 |
| Virginia | 31 | 172,776 | 1,409,447 | 30 | 192,429 | 1,491,568 |
| Washington | 6 | 28,188 | 353,450 | 6 | 29,636 | 357,297 |
| West Virginia | 10 | 238,714 | 1,884,682 | 9 | 270,895 | 1,879,223 |
| Wisconsin | 25 | 235,030 | 2,129,701 | 25 | 244,903 | 2,204,504 |
| Wyoming | 1 | * | * | ---------- | ---------- | ---------- |
| Undistributed | ---------- | 79,296 | 871,178 | ---------- | 99,415 | 1,029,524 |
|  | **450 | 4,072,000 | 39,596,423 | 450 | 4,580,823 | 42,609,141 |

*Included under "Undistributed." **Revised figures.

*Lime sold by producers in the United States, by uses, 1924-25*

| Use | Quantity | | Value | |
|---|---|---|---|---|
| | Percentage of total | Short tons | Total | Average |
| 1924 | | | | |
| Agricultural | 6.1 | 248,336 | $1,864,514 | $7.51 |
| Building | 53.3 | 2,169,700 | 23,011,935 | 10.61 |
| Chemical: | | | | |
| Glass works | 1.8 | 72,822 | 622,456 | 8.55 |
| Metallurgy | 8.3 | 336,813 | 2,727,518 | 8.10 |
| Paper Mills | 7.3 | 300,101 | 2,528,242 | 8.42 |
| Refractory lime (dead-burned dolomite) | 8.1 | 328,659 | 3,209,257 | 9.76 |
| Sugar refineries | .4 | 17,061 | 246,079 | 14.42 |
| Tanneries | 1.3 | 53,349 | 515,133 | 9.66 |
| Other uses* | 13.4 | 545,159 | 4,871,289 | 8.94 |
| Total chemical | 40.6 | 1,653,964 | 14,719,974 | 8.90 |
| | 100.0 | 4,072,000 | 39,596,423 | 9.72 |
| Hydrated lime (included in above totals) | ........ | 1,316,664 | 13,199,846 | 10.03 |
| 1925 | | | | |
| Agricultural | 6.5 | 298,976 | 2,129,169 | 7.12 |
| Building | 52.1 | 2,387,267 | 24,115,420 | 10.10 |
| Chemical: | | | | |
| Glass works | 1.6 | 73,011 | 622,909 | 8.53 |
| Metallurgy | 9.0 | 411,190 | 3,007,228 | 7.31 |
| Paper mills | 8.2 | 376,670 | 3,174,851 | 8.43 |
| Refractory lime (dead-burned dolomite) | 8.6 | 392,147 | 3,730,510 | 9.51 |
| Sugar refineries | .4 | 19,089 | 280,985 | 14.72 |
| Tanneries | 1.4 | 62,933 | 557,187 | 8.85 |
| Other uses* | 12.2 | 559,540 | 4,990,882 | 8.92 |
| Total chemical | 41.4 | 1,894,580 | 16,364,552 | 8.64 |
| | 100.0 | 4,580,823 | 42,609,141 | 9.30 |
| Hydrated lime (included in above totals) | ........ | 1,560,848 | 15,287,461 | 9.79 |

*Details of distribution shown in following table.

It is necessary to classify much material as "unspecified," because many of the manufacturers do not report the uses of that part of their lime which they sell for chemical purposes. This lime is known to be applied to several of the uses enumerated, but the following figures are the best available:

### *Chemical lime sold by producers in the United States for "other uses," 1924-25*

| Use | 1924 |  | 1925 |  |
|---|---|---|---|---|
|  | Short tons | Value | Short tons | Value |
| Acetic acid | ........ | ........ | 6,527 | $55,532 |
| Alcohol manufacture and dehydration | 9,182 | $74,324 | 681 | 5,556 |
| Alkali works (ammonia, soda, potash) | 13,351 | 117,401 | 30,617 | 255,618 |
| Bleaching powder | 18,723 | 179,473 | 12,939 | 105,748 |
| Bleach, liquid | 15,405 | 150,222 | 5,258 | 49,531 |
| Calcium acetate | 4,125 | 33,062 | 10,526 | 90,062 |
| Calcium carbide | 14,921 | 140,196 | 16,354 | 140,000 |
| Coke and gas manufacture (gas purification and plant by-products) | 25,142 | 197,122 | 28,999 | 224,433 |
| Creameries and dairies | 1,546 | 31,826 | 2,083 | 42,697 |
| Disinfectants (chloride of lime, etc.) | 530 | 3,674 | 4,268 | 38,588 |
| Flour mills | 185 | 2,793 | 415 | 4,430 |
| Glue | 6,469 | 58,740 | 11,739 | 100,008 |
| Insecticides (spraying materials) | 11,593 | 121,365 | 14,019 | 137,564 |
| Oil and fat manufacture | 3,036 | 34,709 | 4,416 | 53,935 |
| Paint (kalsomine, whitewash, varnish, etc.) | 4,756 | 45,760 | 3,894 | 31,869 |
| Rubber | 1,631 | 19,801 | 3,509 | 42,302 |
| Salt refining | 1,480 | 13,631 | 1,100 | 8,320 |
| Sand-lime and slag brick | 26,549 | 231,804 | 25,144 | 210,450 |
| Sanitation (sewage and garbage purification, etc.) | 7,396 | 56,326 | 9,307 | 69,050 |
| Silica brick | 10,495 | 90,127 | 25,901 | 234,741 |
| Soap | 32,807 | 197,272 | 16,008 | 106,003 |
| Textiles | 2,386 | 20,772 | 1,032 | 11,817 |
| Water purification | 113,577 | 1,073,080 | 115,776 | 1,085,825 |
| Wood distillation | 5,871 | 56,486 | 2,807 | 27,206 |
| Undistributed* | 11,008 | 118,254 | 35,193 | 295,013 |
| Unspecified | 202,995 | 1,803,069 | 170,968 | 1,564,584 |
|  | 545,159 | 4,871,289 | 559,540 | 4,990,882 |

*1924: Lime used in acid neutralization, artificial silk, asphalt, buffing compounds, corn products, dyes, explosives, food products, gelatin (edible), magnesia, oxygen, proprietary medicines, sheep dip, and snuff. 1925: Lime used in acid neutralization and drying, asphalt and clay filler, baking powder, bichromate refining, buffing compounds, dyes, explosives, fertilizer filler, food products, gelatin (edible), magnesia, oil refining, poultry food, proprietary medicines, sheep dip, and tobacco.

*Lime sold by producers in the United States in 1925, by States and uses*

| State | Building |  | Agricultural |  | Chemical |  |  |  |  |  |  |  |  |  |  |  | Total |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  | Glass works |  | Paper mills |  | Sugar refineries |  | Tanneries |  | Metallurgy |  | Other chemical uses |  |  |  |
|  | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value |
| Alabama | 56,942 | $537,358 | * | * | * | * | * | * | ------ | ------ | * | * | * | * | 41,307 | $317,090 | 207,699 | $1,679,155 |
| Arizona | 14,964 | 188,874 | * | * | * | * | ------ | ------ | ------ | ------ | * | * | * | * | * | * | 39,045 | 394,023 |
| Arkansas | 17,566 | 166,608 | * | * | * | * | * | * | ------ | ------ | ------ | ------ | * | * | * | * | 24,791 | 223,965 |
| California | 49,840 | 533,469 | 7,691 | $49,281 | ------ | ------ | * | * | * | * | * | * | * | * | 6,497 | 78,920 | 70,805 | 745,132 |
| Colorado | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * | * | * | * | * |
| Connecticut | 56,571 | 656,722 | * | * | ------ | ------ | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 58,449 | 672,821 |
| Florida | * | * | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 17,793 | 186,650 |
| Georgia | * | * | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * |
| Hawaii | * | * | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * | * | * |
| Idaho | * | * | * | * | ------ | ------ | ------ | ------ | * | * | ------ | ------ | ------ | ------ | * | * | * | * |
| Illinois | 50,558 | 541,377 | * | * | ------ | ------ | 10,689 | $84,814 | * | * | 4,111 | $38,967 | 9,185 | $79,302 | 21,444 | 183,671 | 96,066 | 928,632 |
| Indiana | 19,279 | 167,967 | 9,426 | 43,874 | ------ | ------ | 39,404 | 329,131 | * | * | * | * | 17,322 | 144,781 | 39,910 | 359,654 | 127,878 | 1,067,040 |
| Iowa | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * |
| Kentucky | * | * | * | * | ------ | ------ | * | * | ------ | ------ | * | * | * | * | * | * | 9,433 | 71,300 |
| Maine | 63,348 | 834,308 | * | * | ------ | ------ | * | * | * | * | * | * | * | * | * | * | 115,571 | 1,291,812 |
| Maryland | 11,336 | 93,464 | 50,605 | 412,777 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 2,577 | 17,859 | ------ | ------ | 64,518 | 524,100 |
| Massachusetts | 148,246 | 2,163,991 | 7,284 | 25,038 | ------ | ------ | 24,499 | 225,132 | ------ | ------ | ------ | ------ | * | * | * | * | 197,732 | 2,610,279 |
| Michigan | 12,165 | 121,202 | 100 | 1,000 | ------ | ------ | 50,097 | 486,725 | ------ | ------ | 2,351 | 23,469 | ------ | ------ | 30,323 | 277,556 | 95,036 | 909,952 |
| Minnesota | * | * | ------ | ------ | ------ | ------ | * | * | ------ | ------ | ------ | ------ | * | * | * | * | * | * |
| Missouri | 94,910 | 881,105 | 669 | 5,663 | * | * | 15,766 | 174,265 | * | * | 3,291 | 31,936 | 34,553 | 281,596 | 123,060 | 1,226,482 | 273,348 | 2,610,954 |
| Montana | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * | * | * | 6,269 | 44,992 |
| Nevada | * | * | ------ | ------ | * | * | ------ | ------ | ------ | ------ | ------ | ------ | * | * | * | * | * | * |
| New Jersey | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * |
| New Mexico | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * | * | * | 1,329 | 14,010 |
| New York | 35,036 | 306,756 | 3,902 | 33,696 | * | * | 18,771 | 194,161 | * | * | 3,101 | 43,686 | 12,764 | 140,766 | 30,664 | 305,405 | 104,829 | 1,030,960 |
| North Carolina | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * | ------ | ------ | ------ | ------ | * | * |
| Ohio | 785,446 | 7,937,117 | 26,004 | 188,236 | 69,460 | 588,146 | 21,697 | 169,609 | * | * | * | * | 9,385 | 80,289 | 176,835 | 2,002,213 | 1,089,385 | 10,970,605 |
| Oklahoma | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * |

*Included under "Undistributed."

*Lime sold by producers in the United States in 1925, by States and uses—(Continued)*

| State | Building | | Agricultural | | Chemical | | | | | | | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Glass works | | Paper mills | | Sugar refineries | | Tanneries | | Metallurgy | | Other chemical uses | | | |
| | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value |
| Oregon | * | * | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | * | * |
| Pennsylvania | 314,333 | 2,786,158 | 129,834 | 958,411 | * | * | 54,149 | 401,574 | * | * | 15,184 | 126,005 | 75,832 | 461,716 | 204,556 | 1,681,875 | 794,951 | 6,425,675 |
| Porto Rico | 343 | 3,053 | 1,435 | 8,989 | -------- | -------- | -------- | -------- | 8,138 | 135,484 | -------- | -------- | -------- | -------- | 72 | 800 | 9,988 | 148,326 |
| Rhode Island | * | * | * | * | -------- | -------- | -------- | -------- | -------- | -------- | * | * | -------- | -------- | * | * | * | * |
| South Dakota | * | * | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | * | * | * | * | * | * |
| Tennessee | 86,562 | 786,637 | * | * | -------- | -------- | 47,126 | 263,707 | * | * | 1,964 | 13,321 | 14,397 | 96,819 | 23,798 | 116,418 | 175,685 | 1,344,508 |
| Texas | 52,961 | 506,118 | -------- | -------- | -------- | -------- | * | * | * | * | -------- | -------- | * | * | 12,460 | 118,955 | 74,638 | 698,138 |
| Utah | 11,232 | 146,956 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | * | * | * | * | 22,062 | 265,060 |
| Vermont | 32,656 | 451,804 | 976 | 4,640 | -------- | -------- | 13,212 | 135,144 | -------- | -------- | 4,872 | 55,460 | 5,556 | 53,483 | 8,973 | 88,405 | 66,245 | 788,936 |
| Virginia | 86,307 | 741,075 | 28,053 | 190,475 | * | * | 5,237 | 37,408 | * | * | 12,305 | 87,741 | 5,654 | 39,131 | 54,373 | 392,038 | 192,429 | 1,491,568 |
| Washington | 21,107 | 257,337 | * | * | * | * | * | * | 2,780 | 37,381 | -------- | -------- | * | * | 2,399 | 30,200 | 29,636 | 357,297 |
| West Virginia | 34,427 | 263,882 | 18,877 | 123,091 | * | * | * | * | -------- | -------- | * | * | 69,728 | 382,733 | 132,193 | 983,203 | 270,895 | 1,879,223 |
| Wisconsin | 232,023 | 2,045,612 | * | * | -------- | -------- | * | * | -------- | -------- | * | * | -------- | -------- | 4,696 | 84,505 | 244,903 | 2,204,504 |
| Undistributed | 98,979 | 999,470 | 14,120 | 83,998 | 3,551 | 34,763 | 76,023 | 673,181 | 8,171 | 108,120 | 15,754 | 136,602 | 154,237 | 1,228,753 | 38,127 | 424,002 | 99,415 | 1,029,524 |
| | 2387267 | 24,115,420 | 298,976 | 2,129,169 | 73,011 | 622,909 | 376,670 | 3,174,851 | 19,089 | 280,985 | 62,933 | 557,187 | 411,190 | 3,007,228 | 951,687 | 8,721,392 | 4,580,823 | 42,609,141 |

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*Included under "Undistributed."

*Building lime.*—Demand for building lime differed greatly in the different States, but most producers reported an increase. Competition was very keen. Of the larger lime-producing States, only Indiana, Maine, Massachusetts, and Michigan showed sales that were less than in 1924 or about the same. Ohio and Pennsylvania are the largest producers of lime for construction, and the sales for this purpose from those States increased, respectively, 17 per cent and 9 per cent in 1925. Over two-thirds of the lime sold from Pennsylvania for this purpose was quicklime, whereas 96 per cent of the building lime furnished by Ohio was hydrated lime, a part of which was high-grade finishing lime. The sales from Ohio, according to grades of lime, are given in the following table:

*Lime sold by Ohio producers for construction, 1923-1925*

| | 1923 | | 1924 | | 1925 | |
|---|---|---|---|---|---|---|
| | Short tons | Value | Short tons | Value | Short tons | Value |
| Quicklime | 33,374 | $281,029 | 33,675 | $282,171 | 34,601 | $274,853 |
| Hydrated lime | 580,999 | 5,832,040 | 637,835 | 6,609,598 | 750,845 | 7,662,264 |
| | 614,373 | 6,113,069 | 671,510 | 6,891,769 | 785,446 | 7,937,117 |

Of the hydrated lime sold by producers in the United States in 1925, Ohio produced 779,286 tons, or about one-half, of which 750,845 tons were sold for construction and were widely distributed throughout the continental United States. Figures of distribution, as reported to the Bureau of Mines, presented for blocks of contiguous States roughly comprising various freight-rate groups, are given below. It is possible that some of the lime reported as supplied to the district including Ohio is reshipped by dealers:

*Shipments of hydrated lime from plants in the United States, 1924-25**

| Shipped to— | 1924 | | | | |
|---|---|---|---|---|---|
| | From all plants | | From Ohio plants | | |
| | Short tons | Distribution (per cent) | Short tons | Distribution (per cent) | Group total (per cent) |
| Illinois, Indiana, Michigan, Ohio | 377,979 | 28.8 | 308,052 | 47.2 | 81.5 |
| Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania, West Virginia | 539,702 | 41.1 | 234,632 | 36.0 | 43.5 |
| Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont | 35,836 | 2.7 | 15,073 | 2.3 | 42.1 |
| Florida, Georgia, North Carolina, South Carolina, Virginia | 125,814 | 9.6 | 48,328 | 7.4 | 38.4 |
| Alabama, Kentucky, Louisiana, Mississippi, Tennessee | 65,141 | 5.0 | 19,225 | 2.9 | 29.5 |
| Arkansas, Iowa, Kansas, Minnesota, Missouri, Nebraska, Oklahoma, Texas, Wisconsin | 130,631 | 10.0 | 26,664 | 4.1 | 20.4 |
| Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming | 36,916 | 2.8 | 757 | .1 | 2.1 |
| | 1,312,019 | 100.0 | 652,731 | 100.0 | 49.8 |

*Figures cover over 99 per cent of total shipments of hydrated lime.

*Shipments of hydrated lime from plants in the United States, 1924-25**

| Shipped to— | 1925 | | | | |
|---|---|---|---|---|---|
| | From all plants | | From Ohio plants | | |
| | Short tons | Distribution (per cent) | Short tons | Distribution (per cent) | Group total (per cent) |
| Illinois, Indiana, Michigan, Ohio | 450,555 | 29.0 | 365,249 | 47.0 | 81.1 |
| Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania, West Virginia | 613,701 | 39.5 | 261,273 | 33.6 | 42.6 |
| Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont | 54,819 | 3.5 | 21,717 | 2.8 | 39.6 |
| Florida, Georgia, North Carolina, South Carolina, Virginia | 172,432 | 11.1 | 71,395 | 9.2 | 41.4 |
| Alabama, Kentucky, Louisiana, Mississippi, Tennessee | 68,271 | 4.4 | 22,833 | 2.9 | 33.4 |
| Arkansas, Iowa, Kansas, Minnesota, Missouri, Nebraska, Oklahoma, Texas, Wisconsin | 141,286 | 9.1 | 33,496 | 4.3 | 23.7 |
| Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming | 51,915 | 3.4 | 1,301 | .2 | 2.5 |
| | 1,552,979 | 100.0 | 777,264 | 100.0 | 50.0 |

*Chemical lime.*—Sales of chemical lime by producers in 1925 increased 15 per cent in quantity, following a decrease of 3 per cent in 1924. Sales for all of the chief chemical activities increased, as did those for many of the minor uses, reported sales of which are apt to vary on account of incompleteness of classification.

*Agricultural lime.*—From 1914 through 1923, with the exception of the year 1919, there was a steady decrease in sales of agricultural lime. In 1924 there was an increase of 3 per cent in the quantity as compared with 1923 and in 1925 an increase of 20 per cent over 1924. All the chief States producing agricultural lime reported increases in sales for 1925. It is also noteworthy that sales of pulverized limestone for agricultural purposes increased 6 per cent in quantity in 1924 and 44 per cent in 1925. Sales of calcareous marl, of which all but a negligible quantity sold as a filler was used for agriculture, decreased 6 per cent in quantity in 1925, and there was also a large decrease in the quantity of lime reported burned from oyster shells.

The following table assembles available data on the quantity and value of different kinds of agricultural lime sold by producers in 1924 and 1925. The method by which the effective lime content of the different forms of land lime is calculated was set forth in Mineral Resources for 1921.

*Agricultural lime sold by producers in the United States, 1924-25, by kinds*

| Kind | Short tons | | Value | |
|---|---|---|---|---|
| | Gross | Effective lime content | Total | Average |
| 1924 | | | | |
| Lime from limestone: | | | | |
| Quicklime | 119,926 | 100,700 | $703,692 | $5.87 |
| Hydrated | 128,410 | 89,900 | 1,160,822 | 9.04 |
| Lime from oyster shells | 40,267 | 33,800 | 242,789 | 6.03 |
| Limestone (pulverized) | 1,352,600 | 581,600 | 2,046,860 | 1.51 |
| Calcareous marl | 72,710 | 31,200 | 225,383 | 3.10 |
| 1925 | | | | |
| Lime from limestone: | | | | |
| Quicklime | 132,011 | 110,800 | 744,518 | 5.64 |
| Hydrated | 166,965 | 116,900 | 1,384,651 | 8.29 |
| Lime from oyster shells | 12,547 | 10,500 | 106,087 | 8.46 |
| Limestone (pulverized) | 1,954,480 | 840,400 | 2,880,589 | 1.47 |
| Calcareous marl | 68,670 | 29,500 | 187,839 | 2.74 |

No attempt has been made to collect figures covering the calcareous marl used for the manufacture of cement, and the figures in the foregoing table represent the output of fresh-water marl, produced chiefly in Virginia (31,114 tons, valued at $70,354) and West Virginia (17,434 tons, valued at $53,219). Other productive States are California, Illinois, Maryland, Michigan, North Carolina, Ohio, South Carolina, Utah, and Wisconsin. During 1925 the Michigan State College, in co-operation with the Michigan Geological Survey, conducted experimental demonstrations of digging marl, by means of special machinery, on farms throughout the State. As a result considerable quantities of marl were dug and used for agricultural purposes. No record of the quantity or value of this material is at present available.

## HYDRATED LIME

The statistics of the output of hydrated lime include only the product made in hydrating machines and omit hand-slaked lime. There was an increase of 19 per cent in the quantity of hydrated lime sold by producers in 1925. The increased sales of hydrated lime were general for all purposes for which this lime was sold.

Fourteen more plants, chiefly in Missouri, New York, Ohio, and Pennsylvania, reported the manufacture of hydrated lime in 1925 than in 1924. The average value per ton decreased 24 cents in 1925. Ohio and Pennsylvania are the largest producers of hydrated lime, producing, respectively, 50 per cent and 14 per cent of the total output in 1925.

*Hydrated lime sold by producers in the United States, 1916-1925*

| Year | Number of plants in operation | Short tons | Value | |
|---|---|---|---|---|
| | | | Total | Average |
| 1916 | 89 | 717,382 | $3,626,998 | $5.06 |
| 1917 | 90 | 709,157 | 4,643,004 | 6.55 |
| 1918 | 90 | 620,216 | 5,342,113 | 8.61 |
| 1919 | 93 | 777,408 | 7,061,146 | 9.08 |
| 1920 | 98 | 853,116 | 9,287,562 | 10.89 |
| 1921 | 105 | 792,970 | 7,421,637 | 9.36 |
| 1922 | 114 | 1,106,063 | 9,868,980 | 8.92 |
| 1923 | 121 | 1,225,928 | 12,229,598 | 9.98 |
| 1924 | *120 | 1,316,664 | 13,199,846 | 10.03 |
| 1925 | 134 | 1,560,848 | 15,287,461 | 9.79 |

*Revised figures.

*Hydrated lime sold by producers in the United States, 1924-25, by States*

| State | 1924 | | 1925 | |
|---|---|---|---|---|
| | Short tons | Value | Short tons | Value |
| Alabama | 23,465 | $215,468 | 25,989 | $229,076 |
| California | * | * | 8,715 | 113,356 |
| Indiana | 44,697 | 400,965 | 43,815 | 410,319 |
| Maryland | 29,134 | 274,195 | 33,768 | 307,805 |
| Missouri | 60,651 | 642,995 | 71,290 | 750,710 |
| New York | * | * | 32,129 | 291,421 |
| Ohio | 654,763 | 6,734,863 | 779,286 | 7,877,738 |
| Pennsylvania | 189,431 | 1,727,749 | 219,737 | 2,020,337 |
| Tennessee | 44,242 | 455,641 | 48,364 | 454,957 |
| Texas | 25,496 | 243,147 | 29,529 | 281,824 |
| Virginia | 38,001 | 334,393 | 52,374 | 440,734 |
| West Virginia | 44,841 | 386,250 | 51,608 | 384,898 |
| Wisconsin | 18,246 | 201,745 | 18,650 | 204,244 |
| Undistributed** | 143,697 | 1,582,435 | 145,594 | 1,520,042 |
| | 1,316,664 | 13,199,846 | 1,560,848 | 15,287,461 |

*Included under "Undistributed."

**1924: Arizona, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Illinois, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Nevada, New York, Rhode Island, Utah, Vermont, and Washington. 1925: Same as 1924, excluding California and New York but including Arkansas and Montana.

### *Hydrated lime sold by producers in the United States, 1924-25 by uses*

| Use | 1924 | | 1925 | |
|---|---|---|---|---|
| | Short tons | Value | Short tons | Value |
| Agricultural | 128,410 | $1,160,822 | 166,965 | $1,384,651 |
| Building | 1,029,384 | 10,420,151 | 1,194,571 | 11,872,556 |
| Chemical: | | | | |
| Glass works | 862 | 10.338 | 1,581 | 16,978 |
| Metallurgy | 5,765 | 65,412 | 9,826 | 103,555 |
| Paper mills | 11,907 | 119,834 | 28,126 | 316,172 |
| Sugar refineries | 4,145 | 51,065 | 5,670 | 77,154 |
| Tanneries | 18,349 | 177,062 | 22,526 | 210,258 |
| Other uses | 117,842 | 1,195,162 | 131,583 | 1,306,137 |
| Total chemical | 158,870 | 1,618,873 | 199,312 | 2,030,254 |
| | 1,316,664 | 13,199,846 | 1,560,848 | 15,287,461 |

## LIME PRODUCERS

### BLOUNT COUNTY

Cheney Lime Co.

### DEKALB COUNTY

Buckels, W. L.

### JACKSON COUNTY

Ala.-Tenn. Lime Co.

### SHELBY COUNTY

- Alabama Lime & Stone Corp.
- Calera Lime Works.
- Keystone Lime Works.
- Longview Lime Works.
- Newala Lime Works.
- Saginaw Lime & Stone Co.
- Superior Lime & Hydrate Co.

# MANGANESE AND MANGANIFEROUS ORES

By J. W. Furness*

## Introduction

In 1925 the domestic shipments of manganese ore containing 35 per cent and more of metallic manganese were 98,324 gross tons, valued at $1,857,769, an increase in tonnage of 74 per cent over 1924, when the output was 56,515 tons, valued at $1,307,477. The difference in average value for the two years is due to the fact that the ratio of the production of chemical ore to that of metallurgical ore decreased, but the quantity of chemical ore produced was nearly the same. The outstanding feature of 1925 was the production in the Butte (Mont.) district of 47,507 tons of rhodochrosite. Most of this ore contained 38 per cent Mn, 2.54 per cent FeO, and 6.11 per cent $SiO_2$ and was utilized in the manufacture of ferromanganese.

The imports of ore are estimated by the Bureau of Mines as 615,000 gross tons, compared with 505,000 tons in 1924. The gross weight of imports of ferromanganese in 1925 is estimated as 78,713 tons, compared with 56,588 tons in 1924. The imports of spiegeleisen in 1925 were 1,090 tons, compared with 7,433 tons in 1924. The increase in the imports of manganese ore during 1925 was in large part consequent to the increase in the production of steel.

Among the many industries expanded by the World War the production of manganese ore in the United States stands almost in a class by itself. Before the war the mines in this country supplied only a small fraction of our needs, but during 1918 they furnished 35 per cent of our total consumption. In order to utilize this output, requirements as to grade that were in vogue in pre-war days were greatly modified. In addition, more than a million tons of high-grade ore were imported during the war period to supplement our needs and to render the domestic ores usable (by mixture with them) without altering the standard grades of our steel. The production during 1917 and 1918 (war period) was 435,220 tons. One might infer that the domestic resources could be rapidly expanded without any material dislocation of peace-time procedure, but such expansion was not possible and only at an extreme monetary sacrifice was the war-time production made. In order to emphasize and explain this point, a summary of the manganese industry since 1918 is presented.

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*The statistics in this report were prepared (unless otherwise stated) by H. M. Meyer, and the data on imports and exports were compiled from records of the Bureau of Foreign and Domestic Commerce by J. A. Dorsey, both of the Bureau of Mines.

### CLASSIFICATION OF MANGANESE ORE

Of all the manganese minerals only the oxides and the carbonates have a merchantable value, although certain silicates of minor importance may be used in the manufacture of silicon-manganese and silicon-spiegel. In Mineral Resources for 1917, part 1, page 668, a new method of classifying manganese ore, based upon the requirements in vogue during the war, was adopted. The suggestion then made—that the steel industry might be satisfied and would continue the use of the grades of alloys adopted during this period—has not materialized. The trade has reverted to the old grades that were acceptable before 1917. Heretofore, in reporting the value per annum of domestic manganese ores the quantities of metallurgical ore and of chemical ore have been merged, making it extremely difficult to obtain the gross value per annum of either of the two classes. In this chapter metallurgical and chemical ores are reported separately. For comparison, however, the statistical classification laid down in Mineral Resources for 1917, already cited, will be continued.

### GENERAL STATEMENT

Manganese is one of the commonest of minerals and is widely disseminated. Deposits are found in many places throughout the world, but in only a few areas are they large enough and of high enough grade to be amenable to our present needs. Of the countries producing the largest tonnage of steel, Russia alone contains manganese deposits that can more than meet its requirements. Before the war Russia, India, and Brazil produced 95 per cent of the world's requirements. In 1914 the Geological Survey of the Gold Coast, West Africa, discovered what are now known as the Dagwin deposits. Since 1922, the world's requirements have been met by the production of the countries mentioned and that of the Gold Coast. Germany and the United States depend upon foreign sources for their needs of this mineral more than any of the countries that produce steel. The war activity in domestic manganese production quickly subsided, and the United States again relies largely on foreign sources for its supply.

Requirements in the United States, however, have not been changed materially since 1918. Ninety-two per cent of all ores utilized find their way into the manufacture of steel and are used in the form of the alloys ferromanganese and spiegeleisen or as crude ores in the manufacture of low-grade manganese pig. The remaining 8 per cent is classed as "chemical ores," and of this by far the larger part is utilized in the manufacture of dry cells. With the increased demand fro mthe radio business, this industry now consumes more than 40,000 tons of high-grade dioxide ore. The remaining smaller part is utilized in the manufacture of glass, brick, etc.

*Ores for metallurgical use.*—The standard requirements for metallurgical purposes are that the ore shall contain not less than 46 per cent of manganese nor more than 6 per cent of iron, 8 per cent of silicon, 0.15 per cent of phosphorus, and 0.5 per cent of sulphur.

Ores of the character outlined are known as manganese ores, a term applicable to those ores from which ferromanganese can be manufactured. With the exception of the oxides, the only other mineral that can now be used for this purpose is rhodochrosite ($MnCO_3$).** Marketable ores of this mineral contain 37 per cent of manganese, less than 1 per cent of iron, and less than 10 per cent of silicon.

As manganese is added to steel as an alloy and a part of it constitutes the final product, any impurities in the crude ore are to a degree found in the resultant steel. It therefore follows that the usability of an ore depends upon its purity. To be suitable for the manufacture of ferromanganese an ore should not contain more than 6 per cent of iron, a necessary requirement, as the accepted standard grade of alloy must contain 78 per cent and more of manganese. As virtually all of the iron contained in the ore goes into the alloy, one can readily see that in making 80 per cent ferro the ratio of iron to manganese becomes an important consideration. The accepted analysis of standard ferro is manganese, 78 to 82 per cent; iron, 8 to 15 per cent; silicon, 0.5 to 1 per cent; carbon, 5 to 7 per cent; phosphorus, 0.1 to 0.3 per cent; and sulphur, under 0.03 per cent. Standard spiegeleisen, the low-grade alloy of manganese, iron, and carbon, has a manganese content of 18 to 22 per cent, iron 70 to 80 per cent, silicon 1 per cent, carbon 5 to 6 per cent, phosphorus 0.15 per cent, and sulphur under 0.05 per cent. As virtually all of the phosphorus contained in the crude ore finds its way into the resultant steel, only ore comparatively free of phosphorus can be used. This requirement eliminates the use of the major reserves of the ore found in the United

States unless the specifications are modified. Ores high in sulphur are not usable, but fortunately such ores are not common.

Two alloys of manganese of lesser importance are used. Silicon-manganese contains manganese, 55 to 70 per cent; iron, 20 to 5 per cent; silicon, less than 25 per cent; carbon, 0.35 per cent. Silicon-spiegal contains manganese, 20 to 50 per cent; iron, 67 to 43 per cent; silicon, 4 to 10 per cent; and carbon, 1.5 to 3.5 per cent. The introduction of manganese into steel not only improves the rolling and forging qualities of the steel but adds greatly to the physical qualities. The deoxidizing and desulphurizing properties of manganese are not found in the same degree in any other metal. These outstanding characteristics are the properties for which manganese finds its principal use. At present no substitute is known. Where certain grades of steel high in manganese and low in carbon are desired, ferromanganese must be used; four times as much spiegel as ferromanganese would be required, and the deleterious impurities in the spiegel would be increased fourfold by the use of this alloy. These alloys are not interchangeable. Only ferromanganese can be used in the manufacture of the high-grade low-carbon steels known in the trade as soft grades. The use of spiegel is prohibited. Soft grades are used in the manufacture of plates, shapes, and structural bars. By far the larger proportion of manufactured steel is required for these uses. As to military needs, only high-grade alloy can be used to meet the ordnance requirement for armor-piercing projectiles and steel requiring highly polished surfaces.

*Ores for chemical use.*—Ores that are amenable to the requirements established for chemical uses fall into several classes. In the manufacture of dry cells the amount of oxygen available determines the value of the material. Before the war the specifications in the United States were that the crude ore must contain as a minimum 85 per cent of $MnO_2$, less than 1 per cent of iron, and no copper. During the war these requirements were greatly modified, and ores containing as low as 65 per cent of $MnO_2$, less than 1 per cent of iron, and less than 0.05 per cent of copper, nickel, and cobalt were utilized. Since the war, probably because of the difficulty of obtaining foreign high-grade peroxide ores, the standard requirements have been lowered and ores of the Philipsburg (Mont.) district have been largely utilized. These ores have a low dioxide content, but because of their

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$2MnCO_3$ contains 47.56 per cent metallic manganese; remainder is $CO_2$.

porosity they have been able to meet successfully the competition of foreign ores. For other chemical uses—such as oxidizing agents where the manganese dioxide is employed in the manufacture of chlorine and bromine, as a decolorizer in glass manufacture, in driers for varnish and paint, and in the manufacture of potassium and sodium permanganates—high-grade ores are required, although they are not as essential as for the uses hertofore mentioned.

*Manganese and manganiferous ore (exclusive of fluxing ore) shipped from mines in the United States, 1924-1925, by States*

| State | Ore containing 35 per cent or more of manganese | | | Ore containing 10 to 35 per cent of manganese | | | Ore containing 5 to 1 per cent of manganes | | |
|---|---|---|---|---|---|---|---|---|---|
| | Shippers | Gross tons | Value | Shippers | Gross tons | Value | Shippers | Gross tons | Value |
| 1924 | | | | | | | | | |
| Metallurgical: | | | | | | | | | |
| Alabama | 3 | 1,242 | 24,954 | 9 | 611 | 6,722 | — | — | — |
| Arizona | 1 | 42 | 798 | — | — | — | — | — | — |
| Arkansas | 6 | 3,400 | 60,350 | 6 | 7,991 | 37,170 | — | — | — |
| California | 2 | 850 | * | — | — | — | — | — | — |
| Colorado | 2 | 5,338 | 48,042 | 7 | 27,058 | 109,289 | 1 | 3,891 | * |
| Georgia | 8 | 1,093 | 18,304 | 19 | 14,182 | 73,684 | 6 | 6,353 | 16,558 |
| Michigan | — | — | — | 1 | 50,556 | 157,184 | 1 | 39,939 | * |
| Minnesota | — | — | — | 4 | 159,915 | 439,132 | 3 | 361,527 | 970,351 |
| Montana | 3 | 11,933 | 123,456 | — | — | — | — | — | — |
| Nevada | 3 | 1,310 | 13,579 | 3 | 2,591 | 15,997 | — | — | — |
| New Mexico | 2 | 775 | * | 2 | 23,246 | * | — | — | — |
| Tennessee | 2 | 455 | 11,611 | — | — | — | — | — | — |
| Utah | — | — | — | 2 | 116 | 1,000 | — | — | — |
| Virginia | 2 | 440 | * | 2 | 204 | * | — | — | — |
| Washington | 1 | 5,000 | 100,000 | — | — | — | — | — | — |
| Wisconsin | — | — | — | — | — | — | 1 | 175,316 | 606,593 |
| Undistributed | — | — | 39,920 | — | — | 89,202 | — | — | 120,441 |
| Total metallurgical | 35 | 31,878 | 441,014 | 55 | 286,470 | 929,390 | 12 | 587,026 | 1,713,943 |
| Chemical: | | | | | | | | | |
| Montana | 3 | 23,512 | 816,463 | — | — | — | — | — | — |
| Virginia | 1 | 1,125 | 50,000 | — | — | — | — | — | — |
| Total chemical | 4 | 24,637 | 866,463 | — | — | — | — | — | — |
| 1925 | | | | | | | | | |
| Metallurgical: | | | | | | | | | |
| Alabama | 2 | 938 | 12,544 | 5 | 298 | 3,087 | — | — | — |
| Arizona | 3 | 294 | 5,102 | — | — | — | — | — | — |
| Arkansas | 4 | 3,517 | 79,335 | 9 | 5,076 | 23,140 | — | — | — |
| California | 3 | 869 | 17,525 | — | — | — | — | — | — |
| Colorado | 1 | 743 | 5,127 | 5 | 7,352 | 26,565 | — | — | — |
| Georgia | 8 | 1,649 | 20,281 | 20 | 28,038 | 26,565 | — | — | — |
| | 1 | * | * | 1 | * | 133,215 | 5 | 7,349 | 23,397 |
| Michigan | — | — | — | 2 | 98,753 | * | — | — | — |
| Minnesota | — | — | — | 3 | 77,665 | * | — | — | — |
| Montana | 4 | 55,659 | 585,031 | — | — | 184,121 | 4 | 741,409 | 1,577,301 |
| Nevada | 2 | 850 | * | 1 | 6,659 | — | — | — | — |
| New Mexico | 2 | 1,588 | * | 2 | 40,848 | * | — | — | — |
| | 2 | * | * | — | — | 153,251 | — | — | — |
| Tennessee | 1 | 352 | 8,800 | 1 | * | — | — | — | — |
| Utah | 1 | 50 | * | 3 | 666 | * | — | — | — |
| Virginia | 3 | 1,499 | 22,981 | 1 | 1,800 | 5,754 | 1 | 496 | * |
| Washington | 1 | 8,113 | * | — | — | — | — | — | — |
| Wisconsin | — | — | — | — | — | — | 1 | 404,014 | * |
| Undistributed | — | 52 | 198,073 | — | 97 | 386,183 | — | — | 1,198,705 |
| Total metallurgical | 38 | 76,173 | 954,799 | 53 | 267,252 | 915,316 | 11 | 1,153,268 | 2,799,403 |
| Chemical: | | | | | | | | | |
| Montana | 3 | 20,529 | 825,970 | — | — | — | — | — | — |
| Virginia | 1 | 1,622 | 77,000 | — | — | — | — | — | — |
| Total chemical | 4 | 22,151 | 902,970 | — | — | — | — | — | — |

*Included under "Undistributed."

## MANGANESE MINING IN ALABAMA

The 1925 shipments of manganese ore (35 per cent plus manganese) were 938 tons, showing a decrease of 304 tons from the peak of production in 1924. Shipments for 1925 of ferruginous manganese ore containing 10 to 35 per cent were 298 tons, as compared with 611 tons in 1924. There was no production of manganiferous ore. One shipper who contributed materially to the 1924 production did not ship in 1925. The production from 1918 to 1925 would indicate that the price received by the producers of manganese had not justified mining the grades of ore available.

### PRODUCERS

#### Blount County

R. G. Clay, Saye Mine.

#### Coosa County

J. A. Clifford.
R. E. Wardlow.

#### Etowah County

J. S. Bynum.
Fitzwilliam, Hepinstall Co., W. H. Hepinstall.
Gaston Scott.
Alabama Manganese Corp., Middale Mine.

# SAND AND GRAVEL

By Estelle R. Phillips

## Production

According to reports from producers, the sand and gravel sold or used by producers in 1925 in the United States amounted to 172,001,473 short tons, valued at $107,542,123, an increase of 10 per cent in quantity and 11 per cent in value as compared with 1924. Sand alone amounted to 87,182,222 tons, valued at $55,148,325, an increase of 15 per cent in quantity and 13 per cent in value. Gravel alone amounted to 84,819,251 tons, valued at $52,393,798, an increase of 5 per cent in quantity and 9 per cent in value. In both 1924 and 1925 New York led all other States in total quantity of sand and gravel sold or used by producers; Pennsylvania ranked first in total value, and West Virginia first in average value.

*Sand and gravel sold or used by producers in the United States, 1916-1925*

| | Sand | | Gravel (including railroad ballast) | | Total | |
|---|---|---|---|---|---|---|
| | Short tons | Value | Short tons | Value | Short tons | Value |
| 1916 | 42,963,978 | $17,589,849 | 46,127,754 | $12,220,146 | 89,091,732 | $29,809,995 |
| 1917 | 40,845,506 | 21,788,743 | 35,573,819 | 13,508,189 | 76,419,325 | 35,296,932 |
| 1918 | 33,119,820 | 24,363,769 | 28,704,606 | 13,563,310 | 61,824,426 | 37,927,079 |
| 1919 | 35,969,736 | 26,389,679 | 34,606,671 | 19,561,877 | 70,576,407 | 45,951,556 |
| 1920 | 43,776,142 | 39,198,614 | 38,265,246 | 26,462,991 | 82,041,388 | 65,661,605 |
| 1921 | 38,294,954 | 29,049,950 | 41,550,054 | 27,434,295 | 79,845,008 | 56,484,245 |
| 1922 | 49,694,923 | 35,469,920 | 45,172,123 | 29,147,744 | 94,867,046 | 64,617,664 |
| 1923 | 67,365,271 | 48,473,565 | 72,566,882 | 42,430,089 | 139,932,153 | 90,903,654 |
| 1924 | 75,572,010 | 48,844,465 | 80,658,053 | 48,168,650 | 156,230,063 | 97,013,115 |
| 1925 | 87,182,222 | 55,148,325 | 84,819,251 | 52,393,798 | 172,001,473 | 107,542,123 |

### *Sand and gravel sold or used by producers in the United States, 1924-25, by uses*

| Use | 1924 | | 1925 | |
|---|---|---|---|---|
| | Short tons | Value | Short tons | Value |
| Sand: | | | | |
| Glass | 2,169,899 | $3,718,973 | 2,334,921 | $3,836,085 |
| Molding | 4,403,893 | 4,995,268 | 4,995,428 | 5,400,618 |
| Building | 41,376,425 | 23,455,393 | 45.287,240 | 26,306,463 |
| Paving | 20,707,875 | 11,595,499 | 24,876.814 | 13,659,228 |
| Grinding and polishing | 1,756,058 | 2,707,583 | 1,824,449 | 2,525,180 |
| Fire or furnace | 237,143 | 291,175 | 343,716 | 392,932 |
| Engine | 2,024,930 | 1,344,935 | 2,261,635 | 1.395,890 |
| Filter | 74,828 | 150,239 | 106,462 | 249,141 |
| Other | 2,820,959 | 585,400 | 5,151,557 | 1,382,788 |
| Total | 75,572,010 | 48,844,465 | 87,182,222 | 55,148,325 |
| Gravel: | | | | |
| Building | 30,486,874 | 22,718,803 | 32,759,151 | 24,589,689 |
| Paving | 28,830,336 | 18,773,832 | 32,574,570 | 21,411,672 |
| Railroad ballast | 21,340,843 | 6,676,015 | 19,485,530 | 6,392,437 |
| Total | 80,658,053 | 48,168,650 | 84,819,251 | 52,393,798 |
| Grand total | 156,230,063 | 97,013,115 | 172,001,473 | 107,542,123 |

## Sand and gravel sold or used by producers in the United States in 1924, by States and uses

| State | Glass sand | | Molding sand | | Building sand | | Paving sand | | Grinding and polishing sand | | Fire or furnace sand | | Engine sand | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value |
| Alabama | — | — | 19,205 | $19,325 | 391,327 | $128,100 | 247,495 | $122,682 | * | * | * | * | * | * |
| Arizona | — | — | — | — | * | * | — | — | — | — | — | — | * | * |
| Arkansas | * | * | * | * | 52,576 | 41,666 | 188,065 | 128,565 | — | — | — | — | * | * |
| California | * | * | 26,083 | 50,935 | 3,536,109 | 1,999,208 | 1,200,532 | 691,826 | * | * | * | * | 27,714 | $13,978 |
| Colorado | — | — | * | * | 309,385 | 107,952 | 161,381 | 105,571 | — | — | — | — | * | * |
| Connecticut | — | — | 1,669 | 1,434 | 508,579 | 385,343 | * | * | * | * | — | — | * | * |
| Delaware | — | — | 12,511 | 11,268 | 13,436 | 11,004 | * | * | — | — | — | — | * | * |
| District of Columbia | — | — | — | — | * | * | * | * | — | — | — | — | — | — |
| Florida | — | — | — | — | 376,595 | 215,461 | 169,584 | 55,132 | — | — | — | — | * | * |
| Georgia | 14,100 | $8,545 | 15,852 | 3,181 | 286,523 | 99,618 | 420,728 | 90,364 | 3,880 | $1,374 | * | * | 18,368 | 5,840 |
| Hawaii | — | — | — | — | * | * | * | * | — | — | — | — | — | — |
| Idaho | — | — | — | — | 3,000 | 2,700 | * | * | — | — | — | — | 270 | 250 |
| Illinois | 601,509 | 640,655 | 759,248 | 637,961 | 3,255,710 | 1,595,084 | 1,949,338 | 992,838 | 271,254 | 480,184 | 9,148 | $16,634 | 160,387 | 82,110 |
| Indiana | * | * | 573,979 | 252,674 | 1,798,633 | 634,260 | 2,444,949 | 970,403 | * | * | * | * | 124,534 | 35,071 |
| Iowa | — | — | * | * | 653,031 | 317,068 | 575,835 | 234,966 | * | * | — | — | 47,607 | 24,661 |
| Kansas | — | — | — | — | 1,078,101 | 709,829 | 316,363 | 190,633 | — | — | — | — | 18,549 | 8,775 |
| Kentucky | * | * | 36,792 | 46,295 | 572,483 | 390,922 | 151,846 | 103,533 | * | * | * | * | 22,011 | 24,902 |
| Louisiana | * | * | — | — | 363,606 | 263,463 | * | * | — | — | — | — | * | * |
| Maine | — | — | — | — | 17,866 | 9,521 | 15,552 | 10,418 | * | * | — | — | * | * |
| Maryland | * | * | * | * | 1,195,671 | 775,896 | 179,497 | 150,659 | — | — | — | — | 36,265 | 81,165 |
| Massachusetts | * | * | 34,447 | 22,699 | 1,249,050 | 951,072 | 99,900 | 75,897 | 8,931 | 16,748 | * | * | 65,455 | 54,288 |
| Michigan | — | — | 236,766 | 139,648 | 2,049,487 | 907,327 | 1,620,066 | 689,438 | 248,635 | 77,226 | * | * | 2,307 | 1,159 |
| Minnesota | — | — | 12,803 | 15,029 | 770,564 | 377,296 | 326,278 | 165,980 | 3,804 | 9,187 | — | — | 39,931 | 17,367 |
| Mississippi | — | — | 720 | 540 | 181,144 | 79,259 | 100,162 | 46,997 | — | — | — | — | 22,912 | 5,943 |
| Missouri | 161,604 | 225,963 | 73,155 | 49,733 | 832,536 | 467,874 | 616,278 | 285,483 | * | * | — | — | * | * |
| Montana | — | — | — | — | * | * | 10,654 | 6,398 | — | — | — | — | — | — |
| Nebraska | — | — | 4,000 | 6,000 | 694,231 | 233,300 | 113,284 | 67,037 | — | — | — | — | 122,658 | 31,976 |
| Nevada | — | — | — | — | — | — | — | — | — | — | | | | |
| New Hampshire | — | — | — | — | 83,567 | 66,098 | 75,248 | 60,249 | — | — | — | — | 22,942 | 2,089 |
| New Jersey | 184,831 | 298,297 | 424,470 | 580,856 | 1,385,392 | 815,315 | 937,966 | 533,689 | 101,056 | 250,698 | 29,011 | 42,612 | 51,724 | 24,358 |
| New Mexico | — | — | 83 | 75 | * | * | * | * | 550 | 750 | — | — | 22,148 | 9,234 |
| New York | * | * | 607,089 | 1,040,735 | 6,837,896 | 3,248,302 | 1,704,351 | 1,082,249 | 50 | 250 | 5,743 | 4,481 | 115,756 | 70,817 |
| North Carolina | * | * | * | * | 40,250 | 18,142 | 403,052 | 168,156 | — | — | — | — | 18,663 | 7,774 |
| North Dakota | — | — | — | — | * | * | * | * | — | — | — | — | — | — |
| Ohio | 47,154 | 109,539 | 917,733 | 1,206,501 | 2,697,376 | 1,866,432 | 1,450,374 | 995,410 | 72,410 | 259,478 | 39,106 | 87,995 | 83,711 | 47,895 |
| Oklahoma | 28,871 | 50,523 | — | — | 506,738 | 212,088 | 560,555 | 232,321 | 11,682 | 7,828 | — | — | 25,636 | 15,710 |
| Oregon | — | — | — | — | 348,203 | 334,916 | 103,010 | 78,033 | — | — | — | — | 10,592 | 3,284 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pennsylvania | 439,723 | 932,572 | 477,087 | 725,981 | 4,225,100 | 3,352,585 | 1,502,227 | 1,459,762 | 651,956 | 1,047,186 | 23,649 | 42,911 | 343,520 | 379,274 |
| Rhode Island | — | — | * | * | * | * | * | * | — | — | — | — | — | — |
| South Carolina | — | — | — | — | 79,135 | 30,013 | 252,052 | 99,093 | — | — | — | — | * | * |
| South Dakota | — | — | — | — | 41,417 | 32,010 | 24,160 | 17,189 | — | — | — | — | * | * |
| Tennessee | — | — | 18,468 | 18,909 | 694,657 | 616,661 | 167,942 | 111,176 | 74,670 | 65,767 | 2,618 | 2,218 | 33,782 | 27,342 |
| Texas | * | * | * | * | 1,010,119 | 447,162 | 230,125 | 137,284 | 100 | 600 | 7,450 | 4,600 | 46,225 | 18,465 |
| Utah | — | — | — | — | 34,755 | 14,376 | 34,088 | 14,016 | * | * | — | — | * | * |
| Vermont | — | — | * | * | 2,433 | 2,338 | 4,600 | 4,885 | * | * | — | — | 1,600 | 850 |
| Virginia | 55,003 | 124,597 | 12,082 | 13,643 | 498,815 | 293,001 | 281,828 | 127,154 | * | * | * | * | 121,151 | 53,760 |
| Washington | — | — | * | * | 488,231 | 246,982 | 500,957 | 277,267 | — | — | — | — | 41,966 | 14,990 |
| West Virginia | 466,125 | 1,092,524 | * | * | 326,816 | 397,195 | 378,033 | 366,680 | * | * | 4,259 | 6,187 | 162,407 | 179,801 |
| Wisconsin | — | — | 81,337 | 64,803 | 1,703,946 | 577,232 | 709,877 | 307,183 | 17,200 | 36,750 | 5,000 | 7,500 | 60,274 | 26,471 |
| Wyoming | — | — | — | — | * | * | 29,048 | 21,654 | — | — | — | — | * | * |
| Undistributed** | 170,979 | 235,758 | 58,314 | 87,043 | 181,936 | 181,322 | 450,595 | 317,229 | 289,711 | 453,557 | 11,159 | 76,037 | 153,865 | 75,336 |
| Total | 2,169,899 | 3,718,973 | 4,403,893 | 4,995,268 | 41,376,425 | 23,455,393 | 20,707,875 | 11,595,499 | 1,756,058 | 2,707,583 | 37,143 | 291,175 | 2,024,930 | 1,344,935 |
| Average value | — | 1.71 | — | 1.13 | — | 0.57 | — | 0.56 | — | 1.54 | — | 1.23 | — | 0.68 |

*Included under "Undistributed."

*Included under "Undistributed."

*Sand and gravel sold or used by producers in the United States in 1924, by States and uses*—(Continued)

| State | Filter sand | | Other sands | | Building gravel | | Paving gravel | | Railroad ballast gravel | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value |
| Alabama | * | * | * | * | 349,475 | $229,591 | 511,914 | $315,066 | 641,579 | $68,051 | 2,443,753 | $917,914 |
| Arizona | ----- | ----- | ----- | ----- | * | * | ----- | ----- | * | * | 69,225 | 17,752 |
| Arkansas | ----- | ----- | * | * | 68,458 | 51,817 | 669,185 | 401,845 | 1,918,657 | 867,119 | 2,944,022 | 1,560,379 |
| California | * | * | 16,753 | $8,634 | 3,433,634 | 2,127,865 | 1,731,708 | 1,382,683 | 1,129,369 | 331,606 | 11,132,930 | 6,653,536 |
| Colorado | ----- | ----- | * | * | 116,673 | 85,371 | 301,162 | 424,842 | 269,169 | 43,145 | 1,219,526 | 799,215 |
| Connecticut | ----- | ----- | * | * | 389,916 | 408,017 | 62,615 | 42,355 | ----- | ----- | 1,191,421 | 1,175,757 |
| Delaware | * | * | * | * | * | * | ----- | ----- | ----- | ----- | 41,499 | 33,271 |
| District of Columbia | ----- | ----- | ----- | ----- | * | * | ----- | ----- | ----- | ----- | * | * |
| Florida | ----- | ----- | ----- | ----- | * | * | * | * | ----- | ----- | 645,917 | 375,853 |
| Georgia | ----- | ----- | * | * | * | * | * | * | * | * | 874,527 | 242,754 |
| Hawaii | ----- | ----- | ----- | ----- | ----- | ----- | * | * | ----- | ----- | * | * |
| Idaho | ----- | ----- | ----- | ----- | * | * | 30,608 | 10,416 | * | * | 113,028 | 33,734 |
| Illinois | * | * | * | * | 2,382,599 | 1,324,295 | 1,841,225 | 1,086,104 | 1,025,638 | 367,292 | 12,313,979 | 7,281,766 |
| Indiana | ----- | ----- | * | * | 1,144,447 | 649,851 | 3,423,406 | 1,649,411 | 2,011,216 | 711,004 | 12,933,373 | 5,070,339 |
| Iowa | * | * | 10,879 | 3,954 | 311,558 | 289,584 | 563,776 | 483,003 | 226,862 | 62,699 | 2,427,626 | 1,473,066 |
| Kansas | 4,200 | $2,250 | 4,886 | 1,064 | 297,463 | 150,755 | 162,398 | 159,508 | 1,008 | 202 | 1,882,968 | 1,223,016 |
| Kentucky | ----- | ----- | * | * | 626,988 | 396,867 | 635,245 | 403,363 | 1,379,182 | 239,189 | 3,442,457 | 1,629,973 |
| Louisiana | ----- | ----- | * | * | 570,052 | 501,205 | 1,350,705 | 961,896 | 589,649 | 456,077 | 3,132,447 | 2,287,495 |
| Maine | ----- | ----- | ----- | ----- | 24,245 | 32,984 | 39,270 | 43,581 | 201,542 | 47,718 | 303,398 | 149,454 |
| Maryland | ----- | ----- | 1 | * | 916,329 | 1,223,534 | 32,387 | 26,633 | 1,000 | 200 | 2,418,137 | 2,368,813 |
| Massachusetts | * | * | 1,357 | 6,705 | 749,003 | 913,280 | 600,420 | 391,117 | * | * | 2,904,911 | 2,496,148 |
| Michigan | ----- | ----- | * | * | 3,339,045 | 2,269,142 | 3,228,893 | 1,712,910 | 625,635 | 170,894 | 11,381,084 | 5,975,757 |
| Minnesota | 5,557 | 19,450 | 103,751 | 2,077 | 633,791 | 717,482 | 485,329 | 351,296 | 628,199 | 201,865 | 3,000,007 | 1,883,029 |
| Mississippi | ----- | ----- | 100 | 500 | 126,904 | 88,855 | 1,269,132 | 620,514 | 741,837 | 291,680 | 2,442,911 | 1,134,288 |
| Missouri | ----- | ----- | * | * | 852,538 | 498,086 | 597,304 | 277,810 | 817,745 | 145,440 | 4,081,200 | 2,053,436 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Montana | — | — | * | * | 20,648 | 15,517 | 23,866 | 15,783 | 500,997 | 127,178 | 597,161 | 172,151 |
| Nebraska | — | — | 26,943 | 8,517 | 712,860 | 480,166 | 340,172 | 233,568 | 84,252 | 38,935 | 2,098,400 | 1,099,499 |
| Nevada | — | — | — | — | 170 | 53 | — | — | 719,696 | 150,503 | 742,808 | 152,645 |
| New Hampshire | — | — | — | — | 22,697 | 44,313 | 303,509 | 244,974 | 10,581 | 380 | 495,602 | 416,014 |
| New Jersey | 21,065 | 59,857 | 9,999 | 9,500 | 594,592 | 523,486 | 228,255 | 207,096 | — | — | 3,968,361 | 3,345,764 |
| New Mexico | 110 | 150 | — | — | 40,149 | 33,397 | 112,426 | 84,809 | 300,733 | 93,690 | 526,787 | 267,110 |
| New York | 14,792 | 11,758 | * | * | 2,771,860 | 2,108,703 | 1,255,448 | 962,790 | 70,246 | 40,100 | 13,397,540 | 8,583,193 |
| North Carolina | — | — | 2,250 | 2,800 | 221,189 | 270,081 | 383,113 | 406,295 | * | * | 1,098,192 | 889,050 |
| North Dakota | — | — | — | — | * | * | * | * | 249,116 | 27,214 | 312,966 | 86,366 |
| Ohio | * | * | * | * | 2,117,685 | 1,296,511 | 1,538,768 | 1,010,147 | 1,378,875 | 549,175 | 10,379,361 | 7,441,659 |
| Oklahoma | — | — | 8,702 | 1,273 | 134,679 | 75,240 | 433,281 | 239,555 | 136,124 | 59,917 | 1,846,268 | 894,455 |
| Oregon | — | — | 27,870 | 5,098 | 568,801 | 400,699 | 913,144 | 672,282 | 266,436 | 120,802 | 2,238,056 | 1,615,114 |
| Pennsylvania | * | * | * | * | 2,450,313 | 1,952,139 | 1,086,860 | 945,074 | 63,186 | 24,590 | 11,315,209 | 10,927,752 |
| | — | — | — | — | * | * | * | * | — | — | 46,378 | 35,932 |
| South Carolina | — | — | * | * | * | * | 114,032 | 110,033 | * | * | 743,746 | 364,977 |
| South Dakota | * | * | * | * | 14,721 | 13,123 | * | * | 208,991 | 25,096 | 323,303 | 113,602 |
| Tennessee | — | — | — | — | 358,264 | 322,656 | 449,770 | 267,824 | 142,138 | 51,047 | 1,942,309 | 1,483,600 |
| Texas | * | * | 234,380 | 64,710 | 1,347,598 | 1,025,232 | 988,202 | 579,790 | 1,790,952 | 540,726 | 5,674,651 | 2,850,955 |
| Utah | — | — | 219,035 | 45,315 | 53,289 | 21,936 | * | * | 248,893 | 30,129 | 659,588 | 154,793 |
| Vermont | — | — | 12,500 | 4,000 | 3,552 | 4,044 | 2,633 | 1,835 | 41,900 | 13,125 | 131,453 | 34,795 |
| Virginia | * | * | * | * | 481,305 | 568,726 | 305,881 | 294,939 | * | * | 1,897,909 | 1,534,235 |
| Washington | — | — | * | * | 753,295 | 399,533 | 449,067 | 214,114 | 1,227,696 | 240,158 | 3,464,557 | 1,398,506 |
| West Virginia | — | — | — | — | 244,133 | 257,458 | 504,036 | 512,834 | 67,231 | 45,803 | 2,168,045 | 2,888,833 |
| Wisconsin | 6,500 | 14,000 | 321 | 201 | 960,435 | 602,915 | 1,568,459 | 825,304 | 600,607 | 241,116 | 5,713,956 | 2,703,475 |
| Wyoming | — | — | — | — | 15,249 | 20,675 | 51,006 | 47,393 | 501,568 | 70,490 | 615,163 | 173,886 |
| Undistributed** | 22,604 | 42,774 | 2,141,233 | 415,052 | 276,272 | 323,619 | 241,726 | 153,040 | 522,338 | 181,660 | 491,948 | 548,009 |
| Total | †74,828 | †150,239 | §2,820,959 | §585,400 | 30,486,874 | 22,718,803 | 28,830,336 | 18,773,832 | 21,340,843 | 6,676,015 | 156,230,063 | 97,013,115 |
| Average value | — | 2.01 | — | 0.21 | — | 0.75 | — | 0.65 | — | 0.31 | — | 0.62 |

*Included under "Undistributed."

**Includes items entered as "*."

†Includes a small quantity of filter gravel.

§Includes 878,597 tons of sand used as railroad ballast, valued at $118,893, and sand used for railroad fills, bank widening, and other purposes.

*Sand and gravel sold or used by producers in the United States in 1925, by States and uses*

| State | Glass sand | | Building sand | | Molding sand | | Paving sand | | Grinding and polishing sand | | Fire or furnace sand | | Engine sand | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value |
| Alabama | ---------- | ---------- | 20,196 | $20,177 | 507,546 | $176,184 | 270,868 | $141,075 | * | * | * | * | * | * |
| Arizona | ---------- | ---------- | ---------- | ---------- | * | * | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| Arkansas | * | * | * | * | 116,230 | 82,604 | 149,300 | 69,231 | ---------- | ---------- | ---------- | ---------- | * | * |
| California | * | * | 35,742 | 64,717 | 3,432,386 | 2,240,043 | 2,941,322 | 1,591,028 | * | * | * | * | * | * |
| Colorado | ---------- | ---------- | * | * | 154,010 | 120,747 | 104,929 | 80,529 | ---------- | ---------- | ---------- | ---------- | 29,934 | $19,101 |
| Connecticut | ---------- | ---------- | 2,432 | 3,337 | 316,518 | 228,158 | 36,205 | 19,559 | * | * | ---------- | ---------- | * | * |
| Delaware | ---------- | ---------- | * | * | 19,151 | 15,965 | * | * | ---------- | ---------- | ---------- | ---------- | * | * |
| District of Columbia | ---------- | ---------- | ---------- | ---------- | * | * | * | * | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| Florida | ---------- | ---------- | ---------- | ---------- | 1,079,839 | 614,812 | 202,451 | 109,406 | ---------- | ---------- | ---------- | ---------- | * | * |
| Georgia | * | * | * | * | 427,449 | 168,816 | 119,440 | 73,565 | ---------- | ---------- | * | * | 21,152 | 5,492 |
| Hawaii | ---------- | ---------- | ---------- | ---------- | * | * | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| Idaho | ---------- | ---------- | ---------- | ---------- | * | * | 13,202 | 2,805 | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| Illinois | 709,029 | $636,355 | 739,373 | 601,852 | 3,429,381 | 1,539,182 | 2,732,641 | 1,277,456 | 318,129 | $678,164 | * | * | 171,029 | 79,613 |
| Indiana | * | * | 643,305 | 271,184 | 1,726,489 | 657,184 | 1,722,852 | 825,678 | * | * | 71,279 | $22,039 | 302,460 | 51,429 |
| Iowa | ---------- | ---------- | 33,418 | 36,134 | 636,534 | 321,190 | 882,368 | 245,900 | 19,324 | 28,223 | * | * | 40,350 | 24,715 |
| Kansas | ---------- | ---------- | * | * | 1,060,997 | 656,092 | 651,863 | 389,221 | ---------- | ---------- | ---------- | ---------- | 55,023 | 32,236 |
| Kentucky | * | * | 38,689 | 49,242 | 610,680 | 552,996 | 189,317 | 141,822 | * | * | * | * | 20,526 | 19,488 |
| Louisiana | ---------- | ---------- | ---------- | ---------- | 406,574 | 269,058 | 130,366 | 62,364 | ---------- | ---------- | ---------- | ---------- | * | * |
| Maine | ---------- | ---------- | ---------- | ---------- | 27,805 | 20,100 | 1,309 | 725 | 3,500 | 7,000 | * | * | * | * |
| Maryland | * | * | ---------- | ---------- | 1,747,347 | 1,264,030 | 277,586 | 198,942 | ---------- | ---------- | ---------- | ---------- | * | * |
| Massachusetts | * | * | 48,562 | 54,660 | 1,304,313 | 1,207,411 | 291,428 | 205,224 | 9,463 | 13,654 | * | * | 69,105 | 46,185 |
| Michigan | * | * | 581,113 | 255,763 | 1,852,823 | 844,957 | 1,426,953 | 514,878 | * | * | ---------- | ---------- | 2,496 | 1,049 |
| Minnesota | ---------- | ---------- | 10,842 | 6,611 | 882,741 | 547,260 | 354,418 | 141,959 | * | * | * | * | 26,121 | 9,346 |
| Mississippi | ---------- | ---------- | ---------- | ---------- | 129,782 | 56,823 | 161,455 | 76,074 | ---------- | ---------- | ---------- | ---------- | 26,075 | 6,837 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Missouri | 165,200 | 252,271 | 86,680 | 71,651 | 1,147,903 | 806,541 | 1,136,791 | 751,287 | 131,123 | 108,234 | * | * | 23,541 | 17,397 |
| Montana | — | — | — | — | 26,581 | 16,472 | 17,472 | 7,071 | — | — | — | — | * | * |
| Nebraska | — | — | * | * | 686,961 | 244,727 | 146,046 | 53,266 | — | — | — | — | 28,623 | 8,548 |
| Nevada | — | — | — | — | * | * | * | * | — | — | — | — | * | * |
| New Hampshire | — | — | — | — | 18,610 | 19,188 | * | * | — | — | — | — | * | * |
| New Jersey | 195,770 | 310,796 | 449,578 | 597,284 | 1,991,659 | 920,309 | 1,086,052 | 571,152 | 81,119 | 213,057 | 47,145 | 71,391 | 24,920 | 10,816 |
| New Mexico | — | — | * | * | 13,265 | 12,680 | * | * | * | * | — | — | 13,823 | 7,213 |
| New York | * | * | 671,610 | 1,147,072 | 7,271,035 | 3,473,186 | 2,105,599 | 1,315,136 | 9,150 | 8,500 | 10,260 | 8,850 | 111,557 | 63,750 |
| North Carolina | — | — | * | * | 94,011 | 34,842 | 270,434 | 114,300 | * | * | — | — | 14,843 | 5,738 |
| North Dakota | — | — | — | — | 18,607 | 10,652 | * | * | — | — | — | — | — | — |
| Ohio | 57,948 | 114,350 | 851,085 | 1,207,840 | 3,166,732 | 2,222,020 | 1,688,264 | 1,060,466 | 60,733 | 227,577 | 61,018 | 121,918 | 78,477 | 54,620 |
| Oklahoma | * | * | — | — | 412,440 | 241,913 | 373,080 | 210,611 | — | — | — | — | 53,523 | 36,311 |
| Oregon | — | — | — | — | 547,245 | 287,593 | 277,917 | 210,161 | * | * | — | — | * | * |
| Pennsylvania | 418,676 | 845,455 | 537,536 | 792,067 | 4,316,359 | 3,318,878 | 2,068,622 | 1,497,546 | 722,996 | 1,016,954 | 69,559 | 100,132 | 328,729 | 418,396 |
| Rhode Island | — | — | * | * | 4,903 | 3,469 | — | — | — | — | — | — | — | — |
| South Carolina | — | — | — | — | 92,947 | 42,451 | 162,171 | 69,695 | * | * | — | — | * | * |
| South Dakota | — | — | — | — | 60,352 | 38,701 | 298,963 | 41,299 | — | — | — | — | * | * |
| Tennessee | — | — | 14,332 | 11,392 | 601,751 | 535,364 | 254,542 | 202,401 | 42,240 | 39,204 | * | * | 39,510 | 30,041 |
| Texas | * | * | 3,133 | 3,723 | 1,001,009 | 543,185 | 428,598 | 219,162 | — | — | — | — | 62,631 | 24,630 |
| Utah | — | — | — | — | 102,882 | 45,447 | * | * | — | — | — | — | * | * |
| Vermont | — | — | * | * | 2,240 | 1,533 | * | * | * | * | — | — | * | * |
| Virginia | 61,532 | 136,523 | 10,835 | 13,919 | 614,354 | 294,848 | 291,631 | 110,548 | 9,034 | 4,272 | * | * | 139,907 | 68,950 |
| Washington | — | — | * | * | 725,819 | 363,416 | 276,774 | 143,361 | * | * | — | — | 65,915 | 25,687 |
| West Virginia | 501,688 | 1,136,942 | * | * | 397,735 | 401,337 | 368,088 | 421,365 | * | * | * | * | 179,545 | 147,370 |
| Wisconsin | — | — | 102,990 | 83,587 | 1,993,212 | 708,392 | 507,205 | 174,042 | * | * | * | * | 53,786 | 20,107 |
| Wyoming | — | — | — | — | 25,491 | 28,952 | * | * | | | — | — | * | * |
| Undistributed** | 225,078 | 403,393 | 103,978 | 108,406 | 84,542 | 106,755 | 458,292 | 318,918 | 417,638 | 180,341 | 84,455 | 68,602 | 278,034 | 160,825 |
| Total | 2,334,921 | 3,836,085 | 4,995,428 | 5,400,618 | 45,287,240 | 26,306,463 | 24,876,814 | 13,659,228 | 1,824,449 | 2,525,180 | 343,716 | 392,932 | 2,261,635 | 1,395,890 |
| Average value | — | 1.64 | — | 1.08 | — | 0.58 | — | 0.55 | — | 1.38 | — | 1.14 | — | 0.62 |

*Included under "Undistributed."

**Includes items entered as "*."

*Sand and gravel sold or used by producers in the United States in 1925, by States and uses*—(Continued)

| State | Filter sand |  | Other sands |  | Building gravel |  | Paving gravel |  | Railroad ballast gravel |  | Total |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value |
| Alabama | ---------- | ---------- | * | * | 544,038 | $398,507 | 567,189 | $407,848 | 592,485 | $73,610 | 2,683,042 | $1,244,398 |
| Arizona | ---------- | ---------- | ---------- | ---------- | * | * | ---------- | ---------- | * | * | * | * |
| Arkansas | ---------- | ---------- | ---------- | ---------- | 38,480 | 42,400 | 665,799 | 326,720 | 1,032,506 | 474,869 | 2,059,893 | 1,078,303 |
| California | * | * | 27,874 | $13,640 | 2,976,236 | 2,094,357 | 3,413,673 | 2,380,615 | 1,159,771 | 290,637 | 14,077,849 | 8,752,528 |
| Colorado | * | * | 2,716 | 1,113 | 159,488 | 159,430 | 130,596 | 115,874 | * | * | 692,395 | 547,944 |
| Connecticut | ---------- | ---------- | * | * | 142,744 | 150,982 | * | * |  | - - | 1,035,132 | 463,807 |
| Delaware | ---------- | ---------- | ---------- | ---------- | * | * | ---------- | ---------- | ---------- | ---------- | 81,052 | 48,506 |
| District of Columbia | ---------- | ---------- | ---------- | ---------- | * | * | * | * |  |  | * | * |
| Florida | ---------- | ---------- | ---------- | ---------- | 124,728 | 294,757 | * | * | 23,130 | 3,600 | 1,515,529 | 1,089,215 |
| Georgia | ---------- | ---------- | ---------- | ---------- | * | * | * | * | * | * | 741,020 | 303,441 |
| Hawaii | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | * | * |
| Idaho | ---------- | ---------- | ---------- | ---------- | * | * | 35,623 | 15,169 | * | * | 53,180 | 20,142 |
| Illinois | 2,353 | $7,391 | * | * | 2,236,895 | 1,152,803 | 2,532,938 | 1,246,102 | 1,367,952 | 470,089 | 14,954,536 | 8,140,090 |
| Indiana | ---------- | ---------- | * | * | 1,000,112 | 589,595 | 2,734,972 | 1,945,879 | 1,812,850 | 672,732 | 12,054,740 | 5,275,743 |
| Iowa | 6,249 | 7,127 | * | * | 381,496 | 342,653 | 939,102 | 426,781 | 307,689 | 89,207 | 3,297,785 | 1,546,900 |
| Kansas | ---------- | ---------- | * | * | 87,908 | 44,909 | 143,542 | 143,206 | 146,758 | 17,553 | 2,198,870 | 1,303,060 |
| Kentucky | * | * | 24,185 | 14,570 | 529,246 | 499,027 | 377,623 | 274,763 | 588,668 | 186,330 | 2,402,982 | 1,770,458 |
| Louisiana | ---------- | ---------- | * | * | 379,775 | 301,333 | 1,131,421 | 725,917 | 706,043 | 381,660 | 2,807,761 | 1,766,452 |
| Maine | ---------- | ---------- | ---------- | ---------- | 32,248 | 38,217 | * | * | 322,452 | 78,883 | 407,760 | 155,014 |
| Maryland | ---------- | ---------- | ---------- | ---------- | 857,535 | 1,121,856 | 564,063 | 719,903 | * | * | 3,619,534 | 3,500,130 |
| Massachusetts | * | * | * | * | 916,117 | 1,236,193 | 609,586 | 277,682 | 84,492 | 17,271 | 3,349,091 | 3,116,323 |
| Michigan | ---------- | ---------- | * | * | 2,886,661 | 1,907,582 | 2,637,270 | 1,635,362 | 757,911 | 238,423 | 10,878,375 | 5,684,474 |
| Minnesota | * | * | 60,983 | 10,982 | 666,058 | 754,281 | 457,554 | 386,323 | 551,519 | 173,543 | 3,015,793 | 2,046,250 |
| Mississippi | ---------- | ---------- | 41,189 | 12,781 | 359,691 | 301,024 | 817,651 | 376,903 | 995,672 | 290,267 | 2,531,515 | 1,120,709 |
| Missouri | ---------- | ---------- | * | * | 975,056 | 696,957 | 1,120,160 | 727,140 | 711,473 | 155,843 | 5,523,605 | 3,595,187 |
| Montana | ---------- | ---------- | * | * | 106,184 | 55,903 | 39,652 | 19,278 | 772,834 | 178,450 | 1,024,983 | 293,397 |
| Nebraska | * | * | 62,687 | 30,059 | 1,265,371 | 469,305 | 398,836 | 186,907 | * | * | 2,651,473 | 1,027,096 |
| Nevada | ---------- | ---------- | * | * | * | * | * | * | 198,441 | 47,452 | 509,998 | 174,527 |
| New Hampshire | ---------- | ---------- | ---------- | ---------- | * | * | * | * | * | * | 424,330 | 316,248 |
| New Jersey | * | * | * | * | 570,325 | 495,598 | 388,921 | 305,713 | ---------- | ---------- | 4,935,934 | 3,680,064 |
| New Mexico | * | * | ---------- | ---------- | 45,895 | 35,235 | * | * | * | * | 141,013 | 107,204 |
| New York | 13,430 | 14,143 | * | * | 3,736,274 | 2,777,626 | 971,234 | 896,334 | 56,831 | 36,650 | 14,966,616 | 9,750,433 |
| North Carolina | * | * | 58,176 | 27,812 | 180,000 | 226,978 | 324,726 | 336,928 | * | * | 1,108,035 | 886,351 |
| North Dakota | ---------- | ---------- | ---------- | ---------- | * | * | * | * | * | * | 248,084 | 67,155 |
| Ohio | 16,383 | 47,812 | 27,878 | 14,406 | 2,118,715 | 1,554,133 | 1,487,527 | 1,043,750 | 1,671,400 | 685,021 | 11,296,160 | 8,353,913 |
| Oklahoma | ---------- | ---------- | * | * | 274,348 | 156,906 | 396,076 | 225,343 | 50,728 | 21,224 | 1,626,758 | 958,657 |
| Oregon | ---------- | ---------- | * | * | 685,411 | 504,889 | 991,074 | 834,243 | 379,220 | 150,461 | 2,990,845 | 1,998,545 |
| Pennsylvania | 4,630 | 6,890 | 18,414 | 25,231 | 2,658,404 | 2,236,534 | 1,413,095 | 1,163,573 | 47,045 | 17,132 | 12,604,065 | 11,438,788 |
| Rhode Island | ---------- | ---------- | ---------- | ---------- | * | * | * | * | ---------- | ---------- | 131,535 | 45,157 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rhode Island | * | * | * | * | — | — | * | * | * | * | 511,497 | 227,996 |
| South Dakota | * | * | * | * | 14,722 | 14,827 | 1,141,906 | 449,677 | 245,373 | 26,074 | 1,769,922 | 576,248 |
| Tennessee | | | | | 434,702 | 394,432 | 436,009 | 287,768 | * | * | 1,966,730 | 1,533,251 |
| Texas | | | * | * | 1,633,273 | 1,180,513 | 1,058,356 | 698,690 | 1,619,200 | 734,179 | 6,093,476 | 3,478,517 |
| Utah | | | * | * | * | * | * | * | * | * | 466,449 | 189,122 |
| Vermont | | | | | 3,030 | 2,326 | 9,160 | 8,250 | * | * | 192,227 | 35,608 |
| Virginia | | | * | * | 498,363 | 458,503 | 366,540 | 319,472 | * | * | 2,170,000 | 1,491,274 |
| Washington | | | * | * | 813,462 | 410,473 | 1,110,922 | 598,787 | 1,172,597 | 213,041 | 4,197,660 | 1,763,153 |
| West Virginia | | | | | 351,753 | 333,081 | 509,027 | 498,362 | 134,667 | 87,664 | 2,475,689 | 3,083,115 |
| Wisconsin | * | * | * | * | 1,699,684 | 794,975 | 1,559,790 | 685,811 | 190,714 | 57,462 | 6,181,822 | 2,603,672 |
| Wyoming | | | | | 30,158 | 35,625 | 16,688 | 31,725 | * | * | 586,450 | 192,137 |
| Undistributed** | 63,417 | 165,778 | 4,827,455 | 1,232,194 | 344,565 | 324,964 | 1,076,269 | 688,874 | 1,785,109 | 523,110 | 718,283 | 701,421 |
| Total | 106,462 | 249,141 | †5,151,557 | †1,382,788 | 32,759,151 | 24,589,689 | 32,574,570 | 21,411,672 | §19,485,530 | §6,392,437 | 172,001,473 | 107,542,123 |
| Average value | | 2.34 | | 0.27 | | 0.75 | | 0.66 | | 0.33 | | 0.63 |

†Includes 1,269,725 tons of sand, valued at $360,833, used as railroad ballast, and 3,578,046 tons of sand, valued at $716,904, used by the railroads for fills, bank widening, and stock-car bedding.

§Includes scme gravel used by the railroads for fills and other purposes.

## PRICES

The average value per ton of all sand and gravel f. o. b. pit or nearest shipping point, as reported by the producers, was 63 cents in 1925 and 62 cents in 1924. In 1925 the average value of building and filter sands increased as did that of the miscellaneous sands entered in the foregoing tables as "other sands" and composed mainly of sand used by the railroads for ballast and fills. All other classes of sand decreased in average value. The average value of building gravel remained virtually the same as in 1924 and that of paving gravel and of gravel used by the railroads as ballast increased slightly.

*Average value per short ton of sand and gravel sold or used by producers in the United States, 1916-1925*

(Based on amounts received for sales f. o. b. pits or nearest shipping points)

| Kind | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 |
|---|---|---|---|---|---|---|---|---|---|---|
| Glass sand | $0.97 | $1.38 | $1.94 | $1.97 | $2.19 | $1.81 | $1.62 | $1.84 | $1.71 | $1.64 |
| Molding sand | .69 | .92 | 1.04 | 1.10 | 1.46 | 1.29 | 1.17 | 1.21 | 1.13 | 1.08 |
| Building sand | .32 | .39 | .50 | .56 | .68 | .65 | .60 | .61 | .57 | .58 |
| Paving sand | .36 | .41 | .54 | .66 | .68 | .63 | .61 | .59 | .56 | .55 |
| Grinding and polishing sand | .65 | 1.04 | 1.60 | 1.34 | 1.80 | 1.61 | 1.46 | 1.62 | 1.54 | 1.38 |
| Fire or furnace sand | .90 | 1.15 | 1.48 | 1.23 | 1.81 | 1.56 | 1.42 | 1.45 | 1.23 | 1.14 |
| Engine sand | .37 | .59 | .76 | .77 | .82 | .86 | .76 | .76 | .66 | .62 |
| Filter sand | .90 | .76 | 1.47 | 1.48 | 1.27 | 1.11 | 1.99 | 1.20 | 2.01 | 2.34 |
| Railroad ballast gravel | .13 | .17 | .22 | .30 | .32 | .33 | .36 | .29 | .31 | .33 |
| Gravel (exclusive of railroad ballast) | .32 | .46 | .57 | .66 | .81 | .75 | .72 | .72 | .70 | .70 |
| All sand and gravel | .33 | .46 | .61 | .65 | .80 | .71 | .68 | .65 | .62 | .63 |

## GLASS SAND

In 1925 glass sand increased 8 per cent in quantity and 3 per cent in value as compared with 1924. Illinois, with 709,029 tons, was first in quantity; West Virginia, Pennsylvania, New Jersey, and Missouri followed in the order named. West Virginia, with glass sand valued at $1,136,942, was first in total value. Pennsylvania, Illinois, New Jersey, and Missouri followed in order. The average value of glass sand per ton was $1.64 in 1925 as compared with $1.71 in 1924. Eighteen States reported output of glass sand in 1925. Lists of deposits and names of companies were given in the 1924 and earlier reports of this series.

*Glass sand sold or used by producers in the United States 1916-1925*

| Year | Short tons | Value | | Year | Short tons | Value | |
|---|---|---|---|---|---|---|---|
| | | Total | Average | | | Total | Average |
| 1916 | 2,018,317 | $1,957,797 | $0.97 | 1921 | 1,280,359 | $2,314,314 | $1.81 |
| 1917 | 1,942,675 | 2,685,014 | 1.38 | 1922 | 1,768,549 | 2,866,366 | 1.62 |
| 1918 | 2,172,887 | 4,209,728 | 1.94 | 1923 | 2,034,958 | 3,751,778 | 1.84 |
| 1919 | 1,827,409 | 3,593,371 | 1.97 | 1924 | 2,169,899 | 3,718,973 | 1.71 |
| 1920 | 2,165,926 | 4,748,690 | 2.19 | 1925 | 2,334,921 | 3,836,085 | 1.64 |

### MOLDING SAND

There was an increase of 13 per cent in the total quantity of molding sand sold or used by producers and of 8 per cent in the total value. The average value per ton, however, was lower in 1925 than in 1924—$1.08 as compared with $1.13. In quantity of production the leading States in order were Ohio, Illinois, New York, Indiana, Michigan, Pennsylvania, and New Jersey, each producing over 400,000 tons. Ohio led in shipments with 861,085 tons. Ohio led also in the total value of molding sand, its output being valued at $1,207,840; New York, Pennsylvania, Illinois, New Jersey, Indiana, and Michigan followed in order. Thirty-one States reported production of molding sand.

*Molding sand sold or used by producers in the United States, 1916-1925*

| Year | Short tons | Value | | Year | Average | Value | |
|---|---|---|---|---|---|---|---|
| | | Total | Average | | | Short tons | Total |
| 1916 | 4,662,649 | $3,219,839 | $0.69 | 1921 | 1,906,977 | $2,451,966 | $1,29 |
| 1917 | 4,660,968 | 4,303,809 | .92 | 1922 | 3,839,116 | 4,478,405 | 1.17 |
| 1918 | 4,910,178 | 5,121,865 | 1.04 | 1923 | 5,559,644 | 6,730,417 | 1.21 |
| 1919 | 3,774,612 | 4,153,990 | 1.10 | 1924 | 4,403,893 | 4,995,268 | 1.13 |
| 1920 | 5,128,075 | 7,504,759 | 1.46 | 1925 | 4,995,428 | 5,400,618 | 1.08 |

### SAND AND GRAVEL PRODUCERS

#### DALLAS COUNTY

Alabama Concrete Products Co.
State Highway Department—Fourth Division.

#### ELMORE COUNTY

Underwood-Walker Co.
State Highway Department—Fourth Division.

ESCAMBIA COUNTY

Edward Campbell.

ETOWAH COUNTY

W. P. Clayton.

FRANKLIN COUNTY

Spruce Pine Sand & Gravel Co.

GREENE COUNTY

State Highway Department—Fourth Division.

JEFFERSON COUNTY

Southern Gravel Co.
J. M. Acton.

LAMAR COUNTY

Henson Gravel Co.

LOWNDES COUNTY

State Highway Department—Fourth Division.

MACON COUNTY

Chehaw Sand, Gravel & Mfg. Co.

MADISON COUNTY

Huntsville Transfer & Bldg. Material Co.

MOBILE COUNTY

Mobile & Gulf Navigation Co.

MONROE COUNTY

State Highway Department—Fourth Division.

MONTGOMERY COUNTY

Alabama Sand & Gravel Co.
Central Georgia R. R. Co.
Montgomery Sand & Gravel Co.

PERRY COUNTY

State Highway Department—Fourth Division.

ST. CLAIR COUNTY

Carriker Bros. Sand Co.
D. W. Moody.
H. E. Riggan.
L. E. Shurbet.

TALLAPOOSA COUNTY

State Highway Department—Fourth Division.

TUSCALOOSA COUNTY

Baker Sand & Gravel Co., Inc.

WALKER COUNTY

Hager & Kent.

# STONE

By A. T. Coons

*Building stone.*—Aggregate sales of building stone of all kinds increased 8 per cent in quantity and 7 per cent in value over 1924. Granite, limestone, and marble showed about the same increases in quantity, 10 to 11 per cent. Miscellaneous varieties of stone for building also increased, but basalt and sandstone decreased somewhat. Stone for rough construction and for rough and sawed architectural work increased and cut stone decreased. The average value per cubic foot of all building stone in 1925 was slightly less than in 1924. The figures for building stone by kinds, as reported in 1924 and 1925, are as follows:

*Monumental stone.*—Stone for monumental and memorial work decreased 8 per cent in quantity and 6 per cent in value as compared with 1924. Granite for this purpose decreased 9 per cent in quantity and marble 4 per cent. California, Texas, and Wisconsin were the only important States reporting increased sales of monumental granite.

*Paving blocks, curbstone, flagstone, and crushed stone.*—Street and road material in general showed increased sales in 1925, although paving blocks decreased 2 per cent in quantity and flagstones 6 per cent. The decrease in paving blocks was in sandstone blocks (30 per cent), as granite blocks increased somewhat. Stone for curbing increased 33 per cent in quantity. The total quantity of crushed stone sold increased 11 per cent over 1924. Crushed stone for concrete and road work in 1925 increased 9 per cent in quantity and crushed stone reported as railroad ballast increased 22 per cent over 1924.

*Fluxing stone.*—Stone used by blast furnaces, open-hearth steel works, smelters, and other metallurgic plants for fluxing increased 16 per cent in quantity.

*Refractory stone.*—Stone (dolomite, quartzite, and mica schist) reported for refractory use increased 15 per cent. The raw dolomite reported for the manufacture of refractories in 1925 increased 35 per cent. Exact figures for raw dolomite for this purpose are hard to obtain, because sales to furnaces and smelters tend to cause it to be reported as fluxing stone. Operators, who both quarry and dead-burn or sinter dolomite, reported 392,147 short tons of the sintered material for 1925—an increase of 19 per cent. Quartzite (ganister) used in the manufacture of refractory brick, for furnace or converter lining, and for the manufacture of ferrosilicon increased 7 per cent in quantity in 1925, and mica schist used as furnace and kiln lining increased 34 per cent.

*Manufacturing industries and "other uses."*—The total quantity of stone for manufacturing industries and "other uses" increased 22 per cent in 1925, although a few of the individual products decreased.

## *Stone sold or used by producers in the United States, 1924 and 1925, by States*

| State | 1924 Number of active plants | 1924 Short tons (approximate) | 1924 Value | 1925 Number of active plants | 1925 Short tons | 1925 Value |
|---|---|---|---|---|---|---|
| Alabama | 28 | 1,253,990 | $2,003,521 | 21 | 1,392,790 | $2,142,595 |
| Alaska | 1 | * | * | 1 | * | * |
| Arizona | 10 | 160,350 | 176,768 | 13 | 435,060 | 306,763 |
| Arkansas | 17 | **542,190 | **620,626 | 13 | 374,940 | 448,313 |
| California | 146 | 7,192,730 | 8,635,602 | 165 | 9,096,170 | 10,341,815 |
| Colorado | 46 | 825,940 | 1,221,574 | 47 | **674,610 | **881,756 |
| Connecticut | 41 | **1,849,670 | **2,251,566 | 41 | 1,830,210 | 2,655,339 |
| Delaware | 3 | 93,130 | 243,279 | 3 | 118,940 | 219,054 |
| District of Columbia | 5 | 8,370 | 15,760 | 2 | * | * |
| Florida | 29 | 2,973,360 | 2,942,778 | 33 | 4,026,790 | 4,687,107 |
| Georgia | 29 | 565,630 | 4,472,628 | 32 | 734,140 | 4,971,493 |
| Hawaii | 14 | **442,240 | **773,906 | 9 | 348,150 | 675,677 |
| Idaho | 27 | 211,030 | 318,588 | 31 | **317,470 | **424,008 |
| Illinois | 64 | 8,640,960 | 7,959,934 | 72 | 8,576,830 | 7,722,683 |
| Indiana | 91 | **3,824,440 | **17,269,407 | 105 | **4,455,310 | **18,140,974 |
| Iowa | 33 | 607,530 | $712,540 | 26 | 805,140 | $870,230 |
| Kansas | 40 | **726,120 | **960,626 | 48 | **705,780 | **958,779 |
| Kentucky | 74 | 2,173,700 | 2,786,249 | 81 | 1,703,010 | 2,127,504 |
| Louisiana | 2 | * | * | 1 | * | * |
| Maine | 44 | **263,720 | **2,411,938 | 54 | **361,570 | **2,870,442 |
| Maryland | 39 | **1,100,410 | **1,913,395 | 43 | **1,136,880 | **1,853,881 |
| Massachusetts | 98 | **1,936,520 | **6,063,048 | 95 | **2,209,560 | **6,640,333 |
| Michigan | 30 | 10,023,440 | 5,943,680 | 30 | 11,598,680 | 6,671,804 |
| Minnesota | 55 | 804,280 | 4,220,658 | 51 | 753,740 | 3,784,252 |
| Mississippi | 2 | * | * | 2 | * | * |
| Missouri | 120 | **2,320,010 | **4,961,333 | 131 | **2,796,510 | **5,662,835 |
| Montana | 19 | 251,730 | 235,580 | 24 | **237,860 | **222,566 |
| Nebraska | 9 | 222,030 | 285,977 | 7 | 135,910 | 225,669 |
| Nevada | 7 | 202,270 | 167,324 | 5 | 102,710 | 127,359 |
| New Hampshire | 26 | **93,340 | **1,556,598 | 26 | **130,120 | **1,712,138 |
| New Jersey | 52 | 2,149,270 | 3,326,298 | 46 | 2,335,820 | 3,656,943 |
| New Mexico | 8 | 654,610 | 432,023 | 4 | 121,950 | 92,034 |
| New York | 136 | 7,557,320 | 10,981,814 | 141 | **8,869,200 | **12,358,238 |
| North Carolina | 36 | 1,340,840 | 3,133,510 | 30 | **1,565,690 | **3,478,855 |
| Ohio | 135 | 10,455,060 | 11,280,865 | 139 | **12,010,510 | **13,084,572 |
| Oklahoma | 36 | **1,303,030 | **1,499,297 | 28 | 1,418,960 | 1,613,436 |
| Oregon | 93 | 1,592,530 | 1,624,602 | 114 | 1,690,930 | 1,858,644 |
| Pennsylvania | 444 | **14,559,490 | **17,966,836 | 440 | **16,124,590 | **18,870,945 |
| Porto Rico | 11 | 90,830 | 206,011 | 9 | 73,460 | 113,515 |
| Rhode Island | 22 | **171,350 | **742,701 | 21 | **153,230 | **724,428 |
| South Carolina | 11 | 824,030 | 1,527,114 | 13 | 833,100 | 1,315,613 |
| South Dakota | 15 | **166,970 | **362,508 | 27 | 211,880 | 456,342 |
| Tennessee | 55 | **1,437,280 | **3,867,072 | 41 | **1,835.150 | **4,334,891 |
| Texas | 32 | 2,207,050 | 1,886,798 | 36 | **2,503,300 | **2,076,560 |
| Utah | 17 | 640,100 | 446,490 | 21 | 878,270 | 459,722 |
| Vermont | 56 | **295,880 | **9,066,073 | 47 | **283,030 | **8,958,846 |
| Virginia | 61 | 2,223,620 | 2,566,575 | 98 | **2,670,660 | **3,224,259 |
| Washington | 63 | **778,460 | **1,596,088 | 51 | 576,690 | 1,042,165 |
| West Virginia | 57 | 2,618,290 | 3,010,154 | 62 | 3,348,200 | 3,349,143 |
| Wisconsin | 124 | **2,221,910 | **4,087,133 | 134 | **2,541,360 | **4,208,201 |
| Wyoming | 17 | 234,620 | 354,057 | 10 | 133,410 | **245,058 |
| Undistributed | ------- | 312,450 | 751,211 | ------- | 613,100 | 1,349,013 |
| Total | 2,630 | 103,184,120 | 161,870,113 | 2,724 | 115,851,370 | 174.216,792 |

*Included under "Undistributed."

**To avoid disclosing confidential information, certain State totals are slightly incomplete, the figures not included being combined under "Undistributed."

### *Marble sold by producers in the United States, 1924 and 1925, by States*

(Quantities approximate)

| State | 1924 | | 1925 | |
|---|---|---|---|---|
| | Short tons | Value | Short tons | Value |
| Alabama | 33,140 | $626,370 | *37,520 | *$637,498 |
| Alaska | **10,360 | **466,920 | *8,880 | *342,041 |
| Arizona | ** | ** | * | * |
| Arkansas | 3,360 | 26,481 | * | * |
| California | 12,650 | 141,048 | 8,780 | 135,160 |
| Colorado | ** | ** | ** | ** |
| Georgia | 71,040 | 2,651,217 | 82,930 | 2,787,988 |
| Maryland | **14,200 | **188,813 | *25,650 | *213,699 |
| Massachusetts | 7,300 | 232,718 | 5,280 | 189,574 |
| Missouri | 64,580 | *1,237,149 | 62,280 | 1,442,567 |
| New Jersey | ** | ** | * | * |
| New York | 64,220 | 532,358 | 72,270 | 510,900 |
| North Carolina | ** | ** | * | * |
| Pennsylvania | ** | ** | * | * |
| Tennessee | 97,950 | 2,332,337 | 112,840 | 2,478,563 |
| Utah | ** | ** | * | * |
| Vermont | 137,200 | 4,866,824 | 147,720 | 5,144,467 |
| Virginia | ** | ** | * | * |
| Washington | ** | ** | ------------ | ------------ |
| Total | 516,000 | 13,302,235 | 564,150 | 13,882.457 |

*Alabama includes Arkansas; Alaska includes Arizona, Colorado, and Utah. Maryland includes New Jersey, North Carolina, Pennsylvania, and Virginia.

**Alaska includes Arizona, Colorado, Utah, and Washington; Maryland includes New Jersey, North Carolina, Pennsylvania, and Virginia.

## *Limestone sold or used by producers in the United States, 1924 and 1925, by States*

(Quantities approximate)

| State | 1924 | | 1925 | |
|---|---|---|---|---|
| | Short tons | Value | Short tons | Value |
| Alabama | 1,170,640 | $1,253,971 | 1,224,710 | $1,250,742 |
| Arizona | * | * | * | * |
| Arkansas | 145,710 | 125,215 | 50,710 | 51,829 |
| California | 249,860 | 540,777 | 264,690 | 545,749 |
| Colorado | 561,060 | 656,193 | 529,810 | 575,562 |
| Connecticut | * | * | * | * |
| Florida | 2,891,610 | 2,717,486 | 3,795,420 | 4,348,234 |
| Georgia | 185,860 | 383,130 | 189,770 | 385,152 |
| Idaho | 11,730 | 25,253 | 9,270 | 31,053 |
| Illinois | 8,577,220 | 7,916,883 | 8,518,410 | 7,686,005 |
| Indiana | 3,824,440 | 17,269,407 | 4,455,310 | 18,140,974 |
| Iowa | 607,530 | 712,540 | 805,140 | 870,230 |
| Kansas | 766,120 | 960,626 | 705,780 | 958,779 |
| Kentucky | 2,153,610 | 2,629,588 | 1,658,240 | 1,983,941 |
| Louisiana | * | * | * | * |
| Maine | 38,150 | 100,252 | 39,530 | 95,735 |
| Maryland | 350,160 | 495,239 | 389,910 | 582,663 |
| Massachusetts | 75,560 | 216,392 | 164,340 | 347,177 |
| Michigan | 9,901,910 | 5,578,642 | 11,460,000 | 6,327,634 |
| Minnesota | 457,980 | 1,101,607 | 458,920 | 1,218,608 |
| Mississippi | * | * | * | * |
| Missouri | 2,240,200 | 3,616,100 | 2,720,080 | 4,082,920 |
| Montana | 206,150 | 152,644 | 210,760 | 160,207 |
| Nebraska | 222,030 | 285,977 | 135,910 | 225,669 |
| Nevada | * | * | * | * |
| New Jersey | 282,700 | 390,837 | 237,100 | 338,037 |
| New Mexico | 480,720 | 288,446 | * | * |
| New York | 6,969,060 | 8,469,975 | 8,488,910 | 10,149,440 |
| North Carolina | 114,820 | 188,470 | 148,530 | 238,310 |
| Ohio | 10,040,910 | 2,534,401 | 11,493,960 | 9,617,437 |
| Oklahoma | 1,271,930 | 1,334,647 | 1,372,040 | 1,414,241 |
| Oregon | 5,710 | 17,473 | * | * |
| Pennsylvania | 11,558,110 | 12,778,612 | 13,033,880 | 13,630,050 |
| Porto Rico | 90,830 | 206,011 | 73,460 | 113,515 |
| Rhode Island | * | * | * | * |
| South Dakota | 39,360 | 60,713 | 73,080 | 97,880 |
| Tennessee | 1,339,330 | 1,534,735 | 1,722,310 | 1,856,328 |
| Texas | 1,872,530 | 1,483,862 | 2,495,440 | 1,898,185 |
| Utah | 639,220 | 408,195 | 877,240 | 441,529 |
| Vermont | 46,200 | 118,240 | 30,050 | 108,755 |
| Virginia | 1,928,510 | 2,200,417 | 2,252,300 | 2,611,157 |
| Washington | 46,420 | 108,155 | 44,280 | 55,904 |
| West Virginia | 2,334,250 | 2,503,273 | 3,114,280 | 2,998,579 |
| Wisconsin | 1,823,970 | 1,969,885 | 2,105,260 | 2,079,512 |
| Wyoming | 222,970 | 326,446 | 133,410 | 245,058 |
| Undistributed | 149,350 | 208,241 | 167,200 | 245,248 |
| Total | 75,894,430 | 89,868,956 | 85,649,440 | 98,008,028 |

*Limestone sold or used by producers in the United States in 1925, by States and uses*

| State | Number of active plants | Building* | | | | | | Rubble | | Riprap | | Crushed stone | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rough construction | | Rough architectura | | Finished (sawed and cut) | | | | | | Concrete and road metal | | Railroad ballast | |
| | | Short tons | Value | Cubic feet | Value | feet | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value |
| Alabama | 13 | | | ** | ** | ** | ** | | | 48,880 | $42,069 | 132,510 | $144,763 | 133,180 | $77,915 |
| Arizona | 2 | | | | | | | | | | | | | ** | ** |
| Arkansas | 5 | ** | ** | | | | | | | | | ** | ** | | |
| California | 24 | | | | | | | ** | ** | | | 76,520 | 88,286 | ** | ** |
| Colorado | 19 | | | ** | ** | | | | | ** | ** | ** | ** | ** | ** |
| Connecticut | 2 | | | | | | | | | | | ** | ** | | |
| Florida | 26 | | | | | | | | | ** | ** | 3,548,840 | 4,054,708 | 199,460 | 195,590 |
| Georgia | 8 | | | | | | | | | ** | ** | 81,880 | 84,926 | ** | ** |
| Idaho | 3 | | | | | | | | | | | | | | |
| Illinois | 69 | ** | ** | | | | | 10,550 | $18,275 | 405,940 | 405,261 | 5,973,880 | 5,363,668 | 634,050 | 439,458 |
| Indiana | 104 | | | 5,208,400 | 3,137,253 | 6,809,060 | 11,462,757 | 6,070 | 12,188 | 101,630 | 30,516 | 2,768,060 | 2,873,736 | 393,270 | 327,823 |
| Iowa | 26 | ** | ** | | | ** | ** | 2,860 | 4,166 | 49,130 | 56,027 | 597,670 | 674,403 | ** | ** |
| Kansas | 46 | ** | ** | ** | ** | | | 12,620 | 23,177 | 17,340 | 18,391 | 551,330 | 772,941 | 87,560 | 77,922 |
| Kentucky | 74 | 24,200 | $30,085 | 42,080 | 41,426 | 86,630 | 185,220 | ** | ** | 50,360 | 57,052 | 993,240 | 1,213,246 | 528,800 | 380,333 |
| Louisiana | 1 | | | | | | | | | | | ** | ** | ** | ** |
| Maine | 1 | | | | | | | | | | | ** | ** | | |
| Maryland | 20 | 22,580 | 26,119 | | | | | | | | | 328,600 | 467,760 | 3,470 | 3,303 |
| Massachusetts | 8 | ** | ** | | | | | | | | | ** | ** | | |
| Michigan | 21 | 7,030 | 3,410 | | | | | ** | ** | ** | ** | 2,085,950 | 1,283,701 | 473,990 | 341,550 |
| Minnesota | 17 | 3,320 | 4,156 | 262,200 | 337,847 | 93,130 | 326,728 | 8,130 | 12,040 | 54,390 | 33,429 | 337,560 | 450,570 | | |
| Mississippi | 2 | | | | | | | | | | | | | | |
| Missouri | 116 | 26,610 | 19,920 | | | | | 261,530 | 405,948 | 207,880 | 262,592 | 1,971,350 | 3,003,754 | 114,530 | 80,516 |
| Montana | 6 | | | | | | | | | ** | ** | 15,580 | 17,074 | | |
| Nebraska | 7 | | | | | | | | | 7,320 | 8,483 | 90,520 | 96,466 | | |
| Nevada | 2 | | | | | | | | | | | ** | ** | ** | ** |
| New Jersey | 8 | | | | | | | | | | | 11,610 | 17,093 | | |
| New Mexico | 2 | | | | | | | | | | | ** | ** | ** | ** |
| New York | 78 | 80,630 | 78,498 | | | ** | ** | | | 94,020 | 105,008 | 6,302,020 | 7,656,558 | 943,940 | 806,512 |
| North Carolina | 5 | ** | ** | | | | | | | | | 122,690 | 180,283 | | |
| Ohio | 121 | 19,640 | 32,707 | | | | | ** | ** | 24,740 | 24,740 | 5,887,610 | 4,980,349 | 1,721,130 | 1,449,415 |
| Oklahoma | 18 | ** | ** | | | | | | | ** | ** | 917,960 | 1,056,851 | 441,740 | 341,651 |
| Oregon | 2 | | | | | | | | | | | | | | |
| Pennsylvania | 262 | 22,440 | 32,206 | ** | ** | | | ** | ** | | | 3,954,560 | 5,213,328 | 85,410 | 98,322 |
| Porto Rico | 9 | | | | | | | | | | | 66,430 | 87,790 | ** | ** |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rhode Island | 1 | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ........ |
| South Dakota | 9 | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ** | ** | 60,820 | 78,938 | ........ | ........ |
| Tennessee | 29 | ** | ** | ........ | ........ | ** | ** | ........ | ........ | ** | ** | 743,900 | 795,862 | 799,520 | 666,634 |
| Texas | 23 | ........ | ........ | ** | ** | ** | ** | ........ | ........ | 99,420 | 99,366 | 1,071,390 | 871,326 | 1,227,280 | 776,078 |
| Utah | 16 | ........ | ........ | ** | ** | ........ | ........ | ........ | ........ | ** | ** | ** | ** | ** | ** |
| Vermont | 6 | ........ | ........ | ........ | ........ | ........ | ........ | ** | ** | ........ | ........ | ** | ** | ........ | ........ |
| Virginia | 72 | ** | ** | ........ | ........ | ........ | ........ | ........ | ........ | ** | ** | 853,000 | 1,076,305 | 929,120 | 830,244 |
| Washington | 6 | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ** | ** | ........ | ........ | ........ | ........ |
| West Virginia | 30 | ** | ** | ........ | ........ | ........ | ........ | ........ | ........ | ........ | ........ | 446,910 | 565,380 | ** | ** |
| Wisconsin | 91 | 10,600 | 19,926 | ........ | ........ | ........ | ........ | 8,890 | 22,136 | 135,600 | 138,995 | 1,627,810 | 1,519,158 | 166,930 | 128,866 |
| Wyoming | 9 | ** | ** | ........ | ........ | ........ | ........ | ........ | ........ | ** | ** | ........ | ........ | ** | ** |
| Undistributed | ........ | 53,920 | 88,815 | 216,150 | 144,750 | 79,250 | 120,256 | 13,980 | 15,457 | 550,680 | 124,785 | 180,270 | 276,668 | 653,990 | 457,587 |
| Total | 1,422 | 270,970 | 335,842 | 5,728,830 | 3,661,276 | 7,068,070 | 12,094,961 | 324,630 | 513,387 | 1,847,330 | 1,406,714 | 41,800,470 | 44,966,391 | 9,537,370 | 7,479,719 |

*Figures for building stone include small amounts for monumental work.

**Included under "Undistributed."

*Limestone sold or used by producers in the United States in 1925, by States and uses*—(Continued)

| State | Fluxing stone | | Sugar factories | | Glass factories | | Paper mills | | Agriculture | | Other uses | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons (approxima | Value |
| Alabama | 889,840 | $826,685 | — | — | — | — | — | — | ** | ** | ** | ** | 1,224,710 | $1,250,742 |
| Arizona | ** | ** | — | — | — | — | — | — | — | — | — | — | ** | ** |
| Arkansas | — | — | — | — | — | — | — | — | ** | ** | ** | ** | 50,710 | 51,829 |
| California | 55,080 | 110,827 | ** | ** | ** | ** | ** | ** | 11,530 | $37,584 | 78,070 | $208,759 | 264,759 | 545,749 |
| Colorado | 355,060 | 321,353 | 98,260 | 168,097 | — | — | — | — | — | — | 510 | 6,959 | 529,810 | 575,562 |
| Connecticut | ** | ** | — | — | — | — | — | — | ** | ** | ** | ** | ** | ** |
| | — | — | — | — | — | — | — | — | — | — | ** | ** | 3,795,420 | 4,348,234 |
| | ** | ** | — | — | — | — | — | — | 24,150 | 35,050 | 61,000 | 246,021 | 189,770 | 385,152 |
| | — | — | ** | ** | — | — | — | — | ** | ** | ** | ** | 9,270 | 31,053 |
| Idaho | 710,130 | 631,159 | — | — | ** | ** | — | — | 638,490 | 589,797 | 113,850 | 189,426 | 8,518,410 | 7,686,005 |
| Illinois | 112,520 | 33,428 | ** | ** | ** | ** | ** | ** | 127,220 | 125,685 | 17,130 | 65,193 | 4,455,310 | 18,140,974 |
| Indiana | 12,520 | 16,335 | ** | ** | — | — | — | — | 93,010 | 71,722 | ** | ** | 805,140 | 870,230 |
| Kansas | — | — | — | — | — | — | — | — | 2,120 | 3,991 | 28,720 | 50,057 | 705,780 | 958,779 |
| Kentucky | ** | ** | — | — | — | — | — | — | 39,420 | 48,972 | 3,860 | 20,977 | 1,658,240 | 1,983,941 |
| | — | — | — | — | — | — | — | — | — | — | — | — | ** | ** |
| | ** | ** | — | — | — | — | ** | ** | ** | ** | ** | ** | 39,530 | 95,735 |
| | ** | ** | — | — | — | — | — | — | ** | ** | 16,510 | 66,559 | 389,910 | 582,663 |
| Massachusetts | ** | ** | — | — | — | — | — | — | 36,980 | 210,314 | ** | ** | 164,340 | 347,177 |
| Michigan | 6,054,270 | 3,019,919 | ** | ** | ** | ** | ** | ** | 223,480 | 183,806 | 2,428,750 | 1,347,619 | 11,460,000 | 6,327,634 |
| Minnesota | — | — | — | — | — | — | — | — | 20,220 | 18,073 | 7,200 | 35,765 | 458,920 | 1,218,608 |
| | — | — | — | — | — | — | — | — | ** | ** | — | — | ** | ** |
| | ** | ** | ** | ** | ** | ** | — | — | 40,090 | 54,668 | 42,070 | 169,445 | 2,720,080 | 4,082,920 |
| Montana | 165,250 | 103,373 | ** | ** | — | — | — | — | ** | ** | — | — | 210,760 | 160,207 |
| | ** | ** | ** | ** | — | — | — | — | ** | ** | ** | ** | 135,910 | 225,669 |
| | ** | ** | ** | ** | ** | ** | — | — | — | — | ** | ** | ** | ** |
| New Jersey | 174,420 | 153,321 | — | — | — | — | — | — | — | — | ** | ** | 237,100 | 338,037 |
| New Mexico | — | — | — | — | — | — | ** | ** | 71,650 | 218,177 | | | ** | ** |
| New York | 91,360 | 80,313 | — | — | — | — | — | — | ** | ** | 885,460 | 1,123,269 | 8,488,910 | 10,149,440 |
| | ** | ** | — | — | — | $83,273 | ** | ** | 230,270 | 280,747 | ** | ** | 148,530 | 238,310 |
| Ohio | 2,917,380 | 2,048,459 | — | — | 76,860 | ** | — | — | — | — | 597,200 | 695,838 | 11,493,960 | 9,617,437 |
| Oklahoma | — | — | — | — | ** | — | ** | ** | ** | ** | — | — | 1,372,040 | 1,414,241 |
| Oregon | — | — | — | — | — | 92,729 | 29,840 | $38,234 | 102,710 | 399,053 | — | — | ** | ** |
| Pennsylvania | 8,465,170 | 7,294,409 | — | — | 55,140 | — | — | — | ** | ** | 317,990 | 459,490 | 13,033,880 | 13,630,050 |
| | — | — | — | — | — | — | — | — | — | — | — | — | 73,460 | 113,515 |
| | ** | ** | — | — | — | — | — | — | — | — | — | — | ** | ** |
| South Dakota | — | — | ** | ** | ** | — | — | — | 79,230 | 135,529 | ** | ** | 73,080 | 97,880 |
| Tennessee | 25,290 | 28,573 | — | — | — | ** | — | — | ** | ** | 66,980 | 223,905 | 1,722,310 | 1,856,328 |
| Texas | ** | ** | — | — | ** | — | — | — | — | — | ** | ** | 2,495,440 | 1,898,185 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Utah | 207,140 | 170,693 | 49,920 | 103,546 | ---- | ---- | ---- | ---- | ** | ** | ** | ** | 877,240 | 441,529 |
| Vermont | ** | ** | ---- | ---- | ---- | ** | ---- | ---- | 44,860 | 76,686 | ** | ** | 30,050 | 108,755 |
| Virginia | 146,560 | 152,729 | ---- | ---- | ** | ** | ** | ** | ** | ** | 247,540 | 422,516 | 2,252,300 | 2,611,157 |
| Washington | 23,490 | 19,956 | ** | ** | ** | ** | ---- | ---- | 12,100 | 30,445 | ** | ** | 44,280 | 55,904 |
| West Virginia | 2,208,220 | 2,071,698 | ---- | ---- | ** | ---- | ---- | ---- | 55,900 | 85,038 | 87,150 | 84,102 | 3,114,280 | 2,998,579 |
| Wisconsin | 53,330 | 53,397 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 46,200 | 111,996 | 2,105,260 | 2,079,512 |
| Wyoming | ** | ** | 124,160 | 235,509 | ---- | 236,830 | 79,890 | 160,457 | 101,050 | 275,252 | ---- | ---- | 133,410 | 245,058 |
| Undistributed | 173,470 | 181,739 | 199,240 | 289,822 | 192,160 | | | | | | 188,450 | 414,390 | 167,200 | 245,248 |
| Total | 22,840,500 | 17,318,366 | 471,580 | 796,479 | 324,160 | 412,832 | 109,730 | 198,691 | 1,954,480 | 2,880,589 | 5,234,640 | 5,942,286 | 85,649,440 | 98,008,028 |

## SANDSTONE

*Sandstone sold or used by producers in the United States, 1924 and 1925, by States*

(Quantities approximate)

| State | 1924 | | 1925 | |
|---|---|---|---|---|
| | Short tons | Value | Short tons | Value |
| Alabama | 50,210 | $123,180 | 131,870 | $289,692 |
| Arizona | ---------- | ---------- | * | * |
| Arkansas | * | * | * | * |
| California | 622,180 | 765,364 | 782,730 | 939,246 |
| Colorado | 89,050 | 84,984 | 29,220 | 63,268 |
| Connecticut | 15,020 | 27,156 | 12,690 | 40,327 |
| Idaho | 37,760 | 150,484 | 57,610 | 116,200 |
| Illinois | 63,740 | 43,051 | 58,420 | 36,678 |
| Indiana | * | * | * | * |
| Kansas | * | * | * | * |
| Kentucky | 20,090 | 156,661 | 44,770 | 143,563 |
| Massachusetts | * | * | * | * |
| Michigan | 17,670 | 33,736 | 28,280 | 20,179 |
| Minnesota | 53,830 | 131,351 | 68,780 | 154,901 |
| Montana | * | * | 5,350 | 14,394 |
| New Jersey | 11,190 | 18,441 | 34,030 | 50,168 |
| New Mexico | ---------- | ---------- | * | * |
| New York | **303,000 | **1,529,590 | **211,170 | **1,348,455 |
| Ohio | 414,150 | 2,746,464 | 516,550 | 3,467,135 |
| Oklahoma | 2,750 | 5,580 | 2,020 | 5,190 |
| Oregon | 81,900 | 106,752 | * | * |
| Pennsylvania | **1,322,260 | **2,305,743 | **1,351,140 | **2,235,726 |
| South Dakota | 121,500 | 181,400 | 134,810 | 196,607 |
| Tennessee | * | * | * | * |
| Texas | * | * | * | * |
| Utah | * | * | * | * |
| Vermont | * | * | * | * |
| Virginia | * | * | 124,340 | 169,157 |
| Washington | 21,070 | 563,075 | 29,690 | 447,056 |
| West Virginia | 284,040 | 536,881 | 233,920 | 350,564 |
| Wisconsin | 93,910 | 370,702 | 190,340 | 381,905 |
| Wyoming | * | * | * | * |
| Undistributed | 169,370 | 261,504 | 431,600 | 449,605 |
| Total | 3,894,690 | 10,142,099 | 4,479,330 | 10,920,016 |

*Included under "Undistributed." **Includes bluestone.

*Sandstone sold or used by producers in the United States in 1925, by States and uses*

| State | Number of active plants | Building | | | | | | Refractory stone (ganister) | | Paving blocks | | Curbing | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rough construction | | Rough architectural | | Dressed (sawed and cut) | | | | | | | |
| | | Short tons | Value | Cubic feet | Value | Cubic feet | Value | Short tons | Value | Number | Value | Cubic feet | Value |
| Alabama | 5 | ----- | ----- | ----- | ----- | ----- | ----- | * | * | ----- | ----- | ----- | ----- |
| Arizona | 2 | ----- | ----- | ----- | ----- | ----- | ----- | * | * | ----- | ----- | ----- | ----- |
| Arkansas | 2 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| California | 10 | ----- | ----- | ----- | ----- | ----- | ----- | * | * | ----- | ----- | ----- | ----- |
| Colorado | 13 | * | * | 50,200 | $19,118 | * | * | 17,280 | $22,609 | ----- | ----- | ----- | ----- |
| Connecticut | 5 | 3,580 | $4,842 | * | * | * | * | ----- | ----- | ----- | ----- | ----- | ----- |
| Idaho | 6 | ----- | ----- | ----- | ----- | * | * | ----- | ----- | ----- | ----- | ----- | ----- |
| Illinois | 3 | * | * | ----- | ----- | ----- | ----- | * | * | ----- | ----- | ----- | ----- |
| Indiana | 1 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Kansas | 2 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Kentucky | 7 | * | * | * | * | 106,060 | $112,301 | ----- | ----- | ----- | ----- | ----- | ----- |
| Massachusetts | 2 | ----- | ----- | * | * | * | * | ----- | ----- | ----- | ----- | ----- | ----- |
| Michigan | 3 | * | * | * | * | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Minnesota | 5 | * | * | * | * | * | * | ----- | ----- | * | * | ----- | ----- |
| Montana | 3 | ----- | ----- | ----- | ----- | * | * | * | * | ----- | ----- | ----- | ----- |
| New Jersey | 3 | * | * | * | * | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| New Mexico | 2 | * | * | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| New York | 38 | 2,260 | 2,231 | 71,880 | 48,695 | 292,680 | 375,156 | ----- | ----- | 703,490 | $49,577 | 884,610 | $672,954 |
| Ohio | 17 | 5,010 | 15,394 | 550,150 | 241,334 | 940,870 | 1,037,675 | * | * | ----- | ----- | 2,086,450 | 1,514,817 |
| Oklahoma | 3 | 2,020 | 5,190 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Oregon | 1 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Pennsylvania | 95 | 11,480 | 17,309 | 40,000 | 35,233 | 23,740 | 116,669 | 579,950 | 699,336 | 1,486,320 | 116,636 | 230,260 | 187,258 |
| South Dakota | 10 | * | * | * | * | ----- | ----- | * | * | * | * | ----- | ----- |
| Tennessee | 1 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Texas | 1 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Utah | 1 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Vermont | 1 | * | * | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Virginia | 7 | ----- | ----- | * | * | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Washington | 3 | ----- | ----- | ----- | ----- | * | * | ----- | ----- | ----- | ----- | ----- | ----- |
| West Virginia | 32 | * | * | ----- | ----- | ----- | ----- | * | * | ----- | ----- | ----- | ----- |
| Wisconsin | 18 | 3,160 | 4,077 | 19,980 | 22,001 | 9,760 | 24,931 | 143,210 | 178,277 | * | * | ----- | ----- |
| Wyoming | 1 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Undistributed | ----- | 53,590 | 65,012 | 176,150 | 140,210 | 140,090 | 525,716 | 66,940 | 118,172 | 200,480 | 25,200 | ----- | ----- |
| Total | 303 | 81,100 | 114,055 | 908,360 | 506,591 | 1,513,200 | 2,192,448 | 807,380 | 1,018,394 | 2,390,290 | 191,413 | 3,201,320 | 2,375,029 |

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*Included under "Undistributed."

*Sandstone sold or used by producers in the United States in 1925, by States and uses*—(Continued)

| | Flagging | | Rubble | | Riprap | | Crushed stone | | | | Other uses | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Concrete and road metal | | Railroad ballast | | | | | |
| | Cubic feet | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons | Value | Short tons (approximate) | Short tons |
| Alabama | ------ | ------ | * | * | * | * | ------ | ------ | ------ | ------ | ------ | ------ | 131,870 | $289,692 |
| Arizona | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * | ------ | ------ | * | * |
| Arkansas | ------ | ------ | ------ | ------ | * | * | * | * | ------ | ------ | ------ | ------ | * | * |
| California | ------ | ------ | * | * | ------ | ------ | 727,500 | $889,016 | * | * | * | * | 782,730 | 939,246 |
| Colorado | * | * | 3,850 | $5,762 | * | * | * | * | ------ | ------ | ------ | ------ | 29,220 | 63,268 |
| Connecticut | ------ | ------ | * | * | ------ | ------ | * | * | ------ | ------ | ------ | ------ | 12,690 | 40,327 |
| Idaho | ------ | ------ | * | * | ------ | ------ | 54,800 | 54,800 | ------ | ------ | ------ | ------ | 57,610 | 116,200 |
| Illinois | ------ | ------ | ------ | ------ | ------ | ------ | * | * | ------ | ------ | ------ | ------ | 58,420 | 36,678 |
| Indiana | ------ | ------ | ------ | ------ | * | * | ------ | ------ | ------ | ------ | ------ | ------ | * | * |
| Kansas | ------ | ------ | * | * | ------ | ------ | * | * | ------ | ------ | ------ | ------ | * | * |
| Kentucky | * | * | ------ | ------ | * | * | * | * | * | * | * | * | 44,770 | 143,563 |
| Massachusetts | ------ | ------ | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * |
| Michigan | ------ | ------ | ------ | ------ | * | * | * | * | ------ | ------ | * | * | 28,280 | 20,179 |
| Minnesota | ------ | ------ | ------ | ------ | * | * | 54,480 | 80,695 | ------ | ------ | * | * | 68,780 | 154,901 |
| Montana | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 5,350 | 14,394 |
| New Jersey | ------ | ------ | ------ | ------ | * | * | ------ | ------ | ------ | ------ | ------ | ------ | 34,030 | 50,168 |
| New Mexico | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * | ------ | ------ | * | * |
| New York | 102,750 | $77,703 | 10,320 | 4,490 | 8,890 | $6,849 | 72,470 | 110,800 | ------ | ------ | ------ | ------ | 211,170 | 1,348,455 |
| Ohio | 589,440 | 411,544 | 2,000 | 2,543 | 154,630 | 151,713 | 33,660 | 48,583 | * | * | * | * | 516,550 | 3,467,135 |
| Oklahoma | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 2,020 | 5,190 |
| Oregon | ------ | ------ | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * |
| Pennsylvania | 51,110 | 59,703 | 18,800 | 44,840 | 15,390 | 3,056 | 501,560 | 690,804 | 152,780 | $189,576 | 29,430 | $75,306 | 1,351,140 | 2,235,726 |
| South Dakota | ------ | ------ | * | * | 3,220 | 2,695 | 113,456 | 153,617 | ------ | ------ | * | * | 134,810 | 196,607 |
| Tennessee | ------ | ------ | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * |
| Texas | ------ | ------ | ------ | ------ | * | * | * | * | ------ | ------ | ------ | ------ | * | * |
| Utah | ------ | ------ | * | * | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | * | * |
| Vermont | ------ | ------ | * | * | * | * | ------ | ------ | ------ | ------ | | | * | * |
| Virginia | ------ | ------ | ------ | ------ | ------ | ------ | 29,520 | 61,253 | * | * | 14,930 | 23,882 | 124,340 | 169,157 |
| Washington | ------ | ------ | * | * | * | * | ------ | ------ | ------ | ------ | - | | 29,690 | 447,056 |
| West Virginia | ------ | ------ | ------ | ------ | ------ | ------ | 140,770 | 216,050 | ------ | ------ | 85,320 | 125,140 | 233,920 | 350,564 |
| Wisconsin | ------ | ------ | 8,080 | 7,466 | 5,580 | 4,105 | * | * | ------ | ------ | * | * | 190,340 | 381,905 |
| Wyoming | ------ | ------ | * | * | * | * | ------ | ------ | ------ | ------ | ------ | ------ | * | * |
| Undistributed | 18,980 | 13,394 | 363,060 | 509,142 | 44,710 | 48,449 | 107,700 | 108,424 | 262,220 | 169,205 | 78,070 | 171,481 | 431,600 | 449,605 |
| Total | 762,280 | 562,344 | 406,110 | 574,243 | 2[illegible]2,420 | 216,867 | 1,835,910 | 2,414,042 | 415,000 | 358,781 | 207,750 | 395,809 | 4,479,330 | 10,920,016 |

*Included under "Undistributed."

## SANDSTONE PRODUCERS

Harbison-Walker Refractories Co., Pittsburgh, Pa. Quarry at Rock Run, Cherokee County, and also in Calhoun County.

U. S. Engineer's Office, Tuscaloosa, Ala. Quarry at Lock 15, Warrior River, Tuscaloosa County.

Tennessee Coal, Iron & R. R. Co., Jefferson County.

Dixie Construction Co., Tallapoosa County.

## MARBLE PRODUCERS

The Alabama Marble Co., 916 Bell Bldg., Montgomery, Ala. Quarry in Talladega County.

Moretti-Harrah Marble Co., Sylacauga, Ala. Quarry at Sylacauga, Talladega County.

## LIMESTONE PRODUCERS

### ALABAMA

Southern Roads Co.

### BLOUNT COUNTY

Cheney Lime Co.

### ETOWAH COUNTY

C. M. Noble.
East Quarry Co.
Sloss-Sheffield Steel & Iron Co.

### FRANKLIN COUNTY

Rockwood Alabama Stone Co.

### JACKSON COUNTY

N. C. & St. L. R. R.

### JEFFERSON COUNTY

Dolcito Quarry Co.
McDorrough Ore & Mug Co.
Tennessee Coal, Iron & R. R. Co.
Sloss-Sheffield Steel Corp.

### MORGAN COUNTY

W. B. McCulloch.

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